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TRANSACTIONS

—OF THE—

THIRTY-FOURTH ANNUAL SESSION

—OF—

THE MEDICAL SOCIETY

—OF THE—

STATE OF NORTH CAROLINA,

HELD AT CHARLOTTE, APRIL, 1887.

Medical Society of the State of North Carolina.

OFFICERS and COMMITTEES for Year 1887-'8.

President:

DR. T. D. HAIGH, Fayetteville.

Vice-Presidents:

DR. W. T. ENNETT, Burgaw.
" J. B. DUNN, Raleigh.
" THOMAS E. ANDERSON, Statesville.

Secretary:

DR. JULIAN M. BAKER, Tarborough.

Treasurer:

DR. C. M. POOLE, Salisbury.

Orator:

DR. S. D. BOOTH, Oxford.

Essayist:

DR. W. C. GALLOWAY, Snow Hill.

Committee on Publication:

DR. THOMAS F. WOOD, Wilmington.
" GEORGE G. THOMAS, Wilmington.
" W. T. ENNETT, Burgaw.
" J. M. BAKER, Tarborough.

Board of Censors:

[The Board appointed at the time of meeting were allowed to resign on the last day, and their successors have not been appointed at the time of publication of these Transactions.]

Delegates to American Medical Association;

DR. CHAS. J. O'HAGAN, Greenville.
" E. H. HORNADAY, Washington.
" J. H. TUCKER, Henderson.
" JOSEPH GRAHAM, Charlotte.
" JOHN WHITEHEAD, Salisbury.
" EUGENE GRISSOM, Raleigh.
DR. T. S. BURBANK, Wilmington.
" J. B. GUNTER, Mebaneville.
" D. B. FRONTIS, Wadesborough.
" J. W. FAISON, Mt. Olive.
" JNO. K. RUFFIN, Wilson.
" R. H. LEWIS, Raleigh.

Delegates to Virginia Medical Association:

DR. W. T. CHEATHAM, Henderson. DR. L. J. PICOT, Littleton.
DR. R. H. STANCELL, Margarettesville.

Delegates to South Carolina Medical Society:

DR. D. W. BULLUCK, Whitakers. DR. ROBERT F. GRAY, Winston.
DR. SIMMONS B. JONES, Charlotte.

Delegates to American Public Health Association:

DR. J. W. JONES, Tarborough. DR. GEO. W. GRAHAM, Charlotte.
DR. W. D. HILLIARD, Asheville.

Obituary Committee:

DR. S. S. SATCHWELL, Rocky Point. DR. A. A. HILL, Lexington.
DR. W. H. LILLY, Concord.

Chairmen of Sections:

Practice of Medicine—Dr. SIMMONS B. JONES, Charlotte.
Obstetrics and Gynæcology—Dr. S. T. NICHOLSON, Washington.
Microscopy and Pathology—Dr. H. W. LEWIS, Jackson.
Surgery—Dr. PAUL B. BARRINGER, Davidson College.
Medical Jurisprudence—Dr. R. F. GRAY, Winston.
Materia Medica and Therapeutics—Dr. J. H. WAY, Waynesville.

Committee on "Pittman Prize:"

DR. P. E. HINES, Raleigh. DR. R. H. LEWIS, Raleigh.
DR. HUBERT HAYWOOD, Raleigh.

Committee on "Duffy Prize:"

DR. J. J. SUMMERELL, Salisbury. DR. W. P. BEALL, Greensborough.
DR. JOHN WHITEHEAD, Salisbury.

MINUTES

—OF THE—

THIRTY-FOURTH ANNUAL SESSION

——OF THE——

Medical Society of North Carolina.

CHARLOTTE, N. C., April 13, 1887.

FIRST DAY—MORNING SESSION.

The Thirty-fourth Annual Meeting was held in the Opera House, and was called to order by the Chairman of the Committee of Arrangements, Dr. George W. Graham.

Rev. Mr. J. Y. Fair, of the Second Presbyterian church, opened the session with an appropriate prayer.

Mr. F. Brevard McDowell being introduced by the Chairman of the Committee of Arrangements, delivered the following

ADDRESS OF WELCOME.

Gentlemen of the Medical Society of the State of North Carolina:

Your custom of meeting annually in different portions of the State and of inviting distinguished members of other States to be with you, is a custom founded not only upon pleasure and the amity that should exist between various sections, but upon wisdom and utility besides. By this mode the East and the West, the mountains and the sea, the talent, experience and the active thought of the entire State are brought together. The Convention is not the narrow gauge of a neighborhood, but the broad gauge of a State or continent. Provincialism is abolished, a relaxation of harassing home

cares ensues, and the progress that stops not at county or State lines, but whose range, like the eagle's, is as wide and free as the air, holds at least a momentary sway and gives a healthy impetus to science and the profession.

I have been selected by the Charlotte physicians to deliver you an address of welcome. Why I was chosen I know not, for I have been well so long and sick so little, that I have actually been ashamed to look a Charlotte doctor square in the face. But I recognize the fact that the doctors will claim us all, sooner or later. There are three things in this life we cannot escape—death, taxation and the doctors. The doctors are with us at the beginning and at the end of our days. They usher us into existence, and when the jig of life is up, when the hard fight is fought and the sunset flickers on the wall, they stand by our side and ease our pain. The minister offers a silent prayer, and faith and charity, the two handmaidens that minister continually around the mercy-seat, cheer us with hope that we shall cross the death-flood and rest beneath the shadow of the further shore.

An old woman's idea of a great man was one "who was careful of his clothes, who could read the Scriptures without spelling the words, who didn't drink spirits and who could eat a cold dinner on a wash day to save the women folks trouble." Our idea of hospitality, like her's of a great man, is primitive, but it is genuine. We do not stucco a man all over with conventional etiquette, we simply tell the stranger we are glad to see him, and we mean it. Doctors are always welcome, especially when they charge nothing for their visits. Our homes, gentlemen, are open to you—we invite you to share our board and partake of our hospitalities, to drive around our beautiful city and inspect her creditable progress and improvements, view the gold mines around us, admire our peerless women and rejoice with us in the history of a liberty-loving and progressive people and of a great and glorious ancestry.

Should I run wild with the love of our favorite oratorical theme—should I inadvertently speak of the 20th of May, of the Mecklenburg Declaration of Independence, or mention the names of Nathaniel Alexander, Dr. Ephraim Brevard, General Graham and others too often, I will deem it an especial favor if you do not bring out your chestnut bells and ring me down.

There are two things new under the sun—a doctor who will take

his own physic and one who will prescribe for himself when sick. They evince the same abject fear that the hangman did in Barnaby Rudge when brought face to face with the gallows upon which he delighted to execute so many others.

Considering the labor and learning of the profession, I think doctors are poorly paid; when a man is taken with the cramps he will cry, as did the distressed King Richard, "A kingdom, my kingdom, for a horse;" when hale and hearty he will say, "If the Lord will keep the doctors humble we will keep them poor." Your members appear over the world as do the waves upon the surface of the sea, they are part and parcel of the waters and cover the entire deep; your influence is as coextensive, your profession is coeval with time and history. To your ranks turns the great longing, yearning eyes of humanity for a deliverer—one who will lift them out of the bodily bondage of ills, contagious disease, and carry them safely through the Red Sea of tribulation and land them into a peaceful and painless inheritance. Your calling is a lofty and noble one. He who is the admiration of centuries healed the maimed, the sick and the blind. Barring the sacred ministry none other can so freely enter the innermost sanctuary, approach the holy of holies and handle the golden candlesticks of the altars; you can lift the veil, touch the fringe and almost kiss the hem of the robes of the great Physician on high. The border-land where sanity ends and insanity begins is yours to traverse. The most sacred of all secrets, the family, is yours. You can look, but not with the eyes of the world; you can enter the room, but must stand at the door like Sterns' sentinel angel, with finger upon the lip as a seal that the outside shall never know what happens within. Go on in your glorious work of liberating mankind and alleviating human suffering, and, like the Vestal Virgin, keep the fires of progress bright and burning, and cease not until science shall have gained her grand, her full and her final triumph.

In reply to Mr. McDowell, Dr. Charles J. O'Hagan, of Greenville, said:

The Medical Society of the State of North Carolina, through me, tenders you their heartfelt thanks for the hospitable and generous welcome which the people of Charlotte, through you, have extended to it. I would wish, sir, it was in my power to respond in fitting terms to the handsome and generous things you have said.

It is not the first time that the Medical Society has been the recipient of the hospitality of Charlotte, and while you are pleased to be somewhat humorous at our expense, still we rejoice that you let us off so much lighter than did our illustrious countryman Zebulon B. Vance. If my recollection is correct, when we came here several years ago, with that inimitable manner which he alone possesses, he placed at our disposal the property, the houses and all other things, if in return we would only spare your lives. If any doubt still exists among the people of Charlotte I hope they may be expelled. We come here with no hostile intention, and we hope and expect to prolong and extend and make wiser and happier the lives of the men, women and children of Charlotte and Mecklenburg county.

Sir, you apologized for alluding to the great men this county is fortunate to possess. No apology is necessary. We feel we stand here upon historic ground, where the Declaration of Independence, which was signed by the great men of this vicinity more than one hundred years ago, was promulgated, which pledged the lives and honor and wealth of the people, and which was so faithfully carried out.

Not alone in the Seven Years' War of the Revolution, crowned by success at last, but at all times and on all occasions, when it became necessary for the people of North Carolina to show their devotion to principle and right, in the forefront stood the sons of Mecklenburg.

I am no stranger to the men of Mecklenburg, though a stranger to many of those present here to-day.

I have seen and shaken the hand of some of my companions in "the late onpleasantness," and hope before we leave I may see more of them. In the meantime the Medical Society of North Carolina tenders you the hand of grateful thanks for your courtesy, and hopes, when we depart from your beautiful city, we will leave no unpleasantness behind us, and will carry away many pleasant memories of your courtesy and hospitality.

Dr. George W. Graham, as Chairman of the Committee of Arrangements, then turned over the gavel to the President, Dr. H. T. Bahnson, of Salem.

Dr. Bahnson, in assuming the duties of his office, thanked the Committee of Arrangements for the eminently satisfactory manner

in which it had discharged its duties, declared the session formally organized, and instructed the Secretary to call the roll.

As next in order on the programme the President then read his Annual Message.

On motion of Dr. Young the thanks of the Society were tendered the President and his Message referred to the Publication Committee to be printed unabridged.

A motion by Dr. R. H. Lewis, that a committee of three be appointed to report upon the suggestions for the improvement of the Society, as contained in the President's Message, was carried.

It was voted, on motion of Dr. G. G. Thomas, to appoint a committee of three to take suitable action in regard to the names of deceased members that were omitted at previous meetings.

The President stated that the citizens of Charlotte would be heartily welcomed at all the sessions of the Society.

The following committees were announced :

Credentials.—Drs. Joseph Graham, Geo. W. Long and Charles J. O'Hagan.

Finance.—Drs. J. W. Jones, A. G. Carr and Robert Gibbon.

President's Message.—Drs. R. H. Lewis, John McDonald and C. M. Poole.

Obituary.—George G. Thomas, Robert S. Young and W. B. Pritchard.

Dr. R. H. Lewis introduced Dr. Joseph A. White, delegate from the Medical Association of Virginia, and said it gave him great pleasure to welcome Dr. White as a delegate from Virginia.

Dr. White thanked the Society for their kind words and treatment, but it was no more than he expected from the well-known generous hospitality of the Old North State. He not only came as a representative from Virginia, but also in the official capacity as chairman of a committee to carry out one of the suggestions in the President's Message—to draw nearer together the profession of our Southern States. He was the chairman of a committee appointed to organize an inter-State association between the States of Virginia and the Carolinas. He hoped that the project would meet with the approbation of the members of the Society, and that they would take some action towards carrying out this project by the appointment of a committee for that purpose.

The President welcomed the gentleman from Virginia in his dual

capacity, and hoped that he would take part in the proceedings of the Society.

Dr. White announced that the next meeting of the Virginia Medical Association would fall immediately after the meeting of the International Medical Association, and that there would be present at that meeting many men of fame. He invited any and all members of the Society to be present, assuring them a pleasant and profitable visit.

The regular programme for the morning session being exhausted, the Committee on Credentials presented the names of the following physicians as eligible to membership:

H. W. Lewis, Jackson; James F. Beall, Linwood; R. A. Patterson, Aurelian Springs; R. H. Stancill, Margarettsville; S. Westray Battle, Asheville; Joel Hill, Arcadia; Joseph M. Davidson, Mountain Island; Wm. H. Bagwell, Pactolus; Joseph Howell Way, Waynesville; Robert J. Brevard, Charlotte; J. E. Caldwell, Caldwell; James M. Gallagher, Washington; D. O'Donohue, Charlotte; J. M. De Armond, Mint Hill; J. H. Bingham, Garrison, Mecklenburg co.; W. B. Henderson, Mecklenburg co.; H. L. Abernethy, Hickory; A. J. Hoover, Lincolnton; W. D. Pemberton, Stanley co.; Ogden D. King, Wilmington; J. H. M'Duffie, Moore co.; S. S. Daniel, Hertford co.; A. W. Goodwin, Raleigh; R. L. Gibbon, Charlotte.

The following report was submitted by the Board of Censors:

The Board of Censors respectfully report that the Buncombe County Medical Society, through its Board of Censors, have presented Dr. John Henry Williams, of Asheville, upon the charge of unprofessional conduct and false representations.

We have decided upon a precedent established by the action of former Boards of Censors of the Society, that we are not called upon to consider any issues which do not directly affect this Society. And, in accordance with this decision, we have to arraign Dr. John Henry Williams upon the specification made in the report of the Board of Censors of the Buncombe County Medical Society, charging him with making a claim to graduation from the Jefferson Medical College of Philadelphia, and that he did so register himself when he signed the Constitution and By-Laws of this Society at the meeting in Asheville in 1881.

It is in evidence that Dr. Williams' name does not appear on the

list of graduates of the Jefferson Medical College, and William L. Leffman, the clerk of that institution, writes that he cannot find the name of Dr. Williams as a graduate of that school, but he says that in the year 1876 Dr. Williams did matriculate. Dr. Williams, in reply, says that he did not intend to register himself as a graduate of the Jefferson Medical College, but simply as having been in attendance upon lectures there—his intention was to give the name of the college at which he had matriculated. He has written to the Secretary of the Society asking him to erase so much of his signature as related to the Jefferson Medical College, upon the ground just set forth. But Dr. Baker replied that he had no right to alter or amend the record, as it was the property of the Society. We therefore ask the decision of the Society upon the matter—whether Dr. Williams has been guilty of such a misdemeanor towards this Society as to require any discipline looking towards suspension or expulsion, or whether his confession that he signed the roster of the Society in ignorance of the record he was making shall stand as an offset to the charge. All the other matters coming before us in this issue between Dr. Williams and the Buncombe County Medical Society, we shall return to them for settlement, as we have decided that they concern the local Society, and not the State organization.

Respectfully,

W. J. Love,
G. G. Thomas,
W. W. Lane.

The President asked that the Society take some action towards the disposition of the report. Dr. Thomas thought the report could not be accepted without some action of the Society. He said that Dr. Williams had explained that his signature on the books was intended only to convey the impression that he was a matriculate, and not a graduate of the Jefferson Medical College.

Dr. John McDonald moved that, as Dr. Williams had made this declaration that what he had done was merely a mistake, that he be allowed to have erased from the registration such part of his signature as was misleading. Carried.

There being no further business before the Society, the meeting was declared adjourned till 3½ o'clock P. M.

First Day—Afternoon Session.

The meeting was called to order at 3½ o'clock.

Dr. Long moved that a committee of five be appointed to consider Dr. White's suggestion of the morning session as to the establishment of an Inter-State Medical Society. Carried.

The Chair announced the presence on the floor of several distinguished gentlemen, and requested Dr. W. J. Jones to escort Profs. W. C. Dabney, J. J. Chisolm and L. McL. Tiffany to the stand and introduce them to the Society. As these gentlemen advanced to the stand they were greeted with applause.

Dr. Jones escorted these gentlemen to the rostrum, and in presenting them to the Society offered very complimentary and pleasing words or introduction, for each of them. He promised the Society that they would contribute to their store of knowledge and give them much profitable food for thought and mental assimilation.

The Chair announced the presence in the hall of Prof. J. S. Dorsey Cullen, of Richmond, and requested Dr. G. G. Thomas to introduce him to the Society. Dr. Thomas performed this duty in a graceful manner, adding that no words of commendation from him could add to the distinguished gentleman's reputation.

Dr. Summerell stated that he had received a letter from Dr. Crump, of South River, stating that on account of sickness he was unable to be present, and asking to have his paper referred to the Committee on Publication.

On motion Dr. Crump's paper, he being the chairman of the Section on Materia Medica and Therapeutics, was so referred.

Dr. Cheatham, representing the committee to award the Pittman Prize, said by an oversight the essays had not reached him, and asked that he be allowed to examine the papers after the adjournment of the Society and publish the Committee's decision in the next issue of the North Carolina Medical Journal.

Upon motion Dr. Cheatham's request was granted.

On a call from the President for reports of chairmen of sections, Dr. E. M. Littlejohn read a report on "Obstetrics and Gynæcology."

Dr. W. J. Jones, in moving the reference of Dr. Littlejohn's paper to the Committee on Publication, spoke in terms of praise of the production, and said that the interest of the Society would be served in the proper direction if these essays were the starting point of a discussion which shall bring out all that is in the possession of

the members of the Society on the points raised by the author. He then spoke at some length on the issues made by the germ theory.

The President said it was the intention of the Society to have full discussions on these subjects, and reiterated Dr. Jones' request by asking Prof. Dabney to open the

DISCUSSION.

Prof. Dabney said there was very little he could add to the paper which had been read. One or two practical points might be brought to the attention of the Society—one in respect to what is called puerperal septicæmia. That very many of these cases are due to the germ there can be no manner of doubt, still there were cases in which, as soon as all decomposing matter was removed, there was no further trouble, and the fever immediately disappeared. Now truly this would not occur were the symptoms due to a septic germ. The poisoning in these cases is due, not to the presence of germs, but to the presence of decomposing animal matter commonly known as ptomaines—these leucocytes of decomposition. The symptoms in many cases are the same which can be produced in the lower animals by the introduction of ptomaines under the skin. This Dr. Dabney designated puerperal toxæmia, and said that a removal of the exciting cause, generally filth and a want of care for the person of the lying-in woman, would relieve the patient, but this would not obtain when the woman had become the host of the germs which caused the outbreak of puerperal septicæmia, and which required alike local and systemic treatment. Is there no germicide which will destroy these germs and change the condition of the patient? So far as I know there is none which can be administered of sufficient strength to destroy the germs which will not also destroy the life of the patient. What can be done practically? The first point is to abolish the circumstances which favor the development of the germ—to have a strict regard for cleanliness. This is by far the most important point. In other cases of threatening symptoms followed by fever, it is wise to see that there is do decomposing matter in the vagina or in the uterus. It may be a case of ptomaine poisoning. But suppose it is not that, but a genuine case of septicæmia? A want of cleanliness favors the production of germs. He thought there was nothing like injections to remove this decomposing matter, and favored the use of bichlo-

ride of mercury. There are instances of poisoning by injections of corrosive sublimate, but they are few, and he has never known one where the solution was as weak as 12-000. From his experience with injections into the pleural cavities, he thought as efficacious results would be obtained from iodine. He thought it not desirable in country practice to use such extreme antiseptic precautions as were suggested by Dr. Thomas several years ago; but it is necessary to remove every particle of dirt and blood, at least from the external genitals of the woman, for it is there that these germs begin their work.

Prof. Tiffany said it was eminently improper for him to speak on an obstetrical subject. Something had been said about abdominal surgery, but he denied that this belonged to obstetrics, but to surgical gynecology. He thought it necessary to recognize the fact that we do not know everything. We are now in the midst of our study on bacterial pathology and are not yet perfect. There is so much opposed to one view and the other it is not possible to be sure as to any at present. If he were asked the most potent means of avoiding this enemy, he would say "a good nail-brush and soap and water." The first thing is to clean the doctor and then clean the patient. He mentioned the success in the treatment of wounds in the mountain regions far removed from large cities, and the experiments which proved the entire aseptic condition of the air at sea. Be sure that the hands are clean before the operation. The surgeon should operate with sleeves rolled up and his arms washed to the elbows. He should see that the person of his patient is thoroughly cleansed. Absolute cleanliness is of course an antiseptic condition. A germicide does no harm, but first of all comes soap and water. All vessels and instruments to be used should be thoroughly cleansed before an operation. He mentioned the importance of the use of hot water, not only to overcome shock, but to wash out from the cavity any germs which may have found entrance. In regard to the best germicide, he believes that bichloride of mercury holds that position. Ether or oil of turpentine will remove the oil from the skin, which soap and water will not entirely accomplish, and his preference is for turpentine. He thinks that all antisepsis, with our present knowledge, can be obtained from soap and water, the nail-brush and the bichloride solution.

Dr. Chisolm said the part of surgery in which he is engaged

would seem entirely unconnected with the subject in hand. But he explained that there was a connection, and that this micrococcus was the connecting link. One of the most common of eye troubles, and which is placed to be a most common cause of blindness, is the entrance of a germ into the eyes of the child from the vagina of the mother. After a few days it creates an ophthalmia, which, if allowed to go on, results in the loss of the eye. It is an established law in some hospitals that every child, immediately after birth, should have distilled into its eyes, whether ophthalmia was suspected or not, a solution which will destroy any bacillus capable of causing a destructive inflammation. The effect of this protective system is most marked. He said that in eye work the surgeon is bound to be cleanly, for the instruments are very delicate and must be kept clean to be in good order. A very weak solution, not strong enough to produce irritation, is capable of destroying the germ.

Dr. Cullen said in regard to puerperal fever you find many cases occurring in persons on whom the antiseptic treatment was rigidly practised, and in others where it was not used at all. For the past fifteen years he has always injected the vaginal cavity, and, in anything like metritis, the uterine cavity, with an antiseptic. He has used vaginal injections for several years, and has had but one case of puerperal fever in two and a half years. He does not touch the vaginal canal with the hand after the child is born, but washes the vulva with the bichloride solution. He thinks that an immense amount of puerperal fever is caused by bacteria carried into the uterine cavity by the hand. Practicing physicians cannot always surround the woman with these precautions against bacteria, but they can best protect her by washing their own hands. He attributed to antisepsis the great reduction in Germany in deaths from puerperal fever. He urged his hearers to see that everything is clean, and he ventured to say there will be very little puerperal fever, whether injections are used or not, if in addition to cleanliness the hands are kept out of the vaginal canal.

On motion Dr. Littlejohn's report as the chairman of Section on Obstetrics and Gynæcolgy was referred to the Publication Committee.

Dr. Graham, for the Committee on Credentials, reported the names of Drs. H. H. Dodson, Milton, N. C., and W. L. Crouse, Crouse, N. C.

On motion the report was received.

Dr. W. J. Jones stated that he had a paper from Dr. J. D. Roberts of Goldsboro, entitled "Insanity in Its Earlier Stages." He said Dr. Roberts' duties had prevented him from being present, and moved that the paper be referred to the Publication Committee.

It was so referred.

An invitation from the Charlotte Pleasure Club for the members of the Society to participate in a German was read by Dr. Hays.

On motion the thanks of the Society were tendered the Club and the invitation accepted.

Adjourned till 9 P. M.

First Day—Evening Session.

Meeting called to order by the President at 9 o'clock.

Pursuant to the order of business Dr. Geo. Gillett Thomas, of Wilmington, read the Annual Essay, entitled "Hepatic Stimulants and Cholagogues."

On motion of Dr. McDonald, Dr. Thomas' elaborate and instructive paper was referred to the Committee on Publication.

The President announced the following committees:

Nominations—Drs. J. J. Summerell, W. J. Jones, W. H. Whitehead, A. G. Carr and J. P. McCombs.

On the Proposition of Dr. White from the Virginia Medical Society—Drs. W. T. Cheatham, R. F. Lewis, Geo. G. Thomas, Simmons B. Jones and H. B. Weaver.

The Secretary read a communication from Dr. John A. Pollock tendering his resignation as a member of the Society.

The Treasurer stated that Dr. Pollock's dues had not been paid up to date, and the Secretary was instructed to inform Dr. Pollock of this delinquency, and that when his dues are paid his resignation will be accepted.

President Bahnson stated that he had received a paper from Dr. Cornelius Kollock, President of the South Carolina Medical Society, containing a very interesting account of a penetrating gun-shot wound of the abdomen, involving one or more folds of the intestine. He said he had put the paper in so safe a place that he overlooked it in leaving home, and asked to have it referred to the Publication

Committee, and also that the thanks of the Society be tendered Dr. Kollock for his contribution. It was so voted.

Dr. Thomas stated that Dr. W. Gill Wylie, of New York, had intended being present at the meeting, and had prepared a paper entitled "A Substitute for the Pessary."

The Secretary had just received a telegram from Dr. Wyley stating his inability to be present, but that the paper would be sent.

Dr. Thomas moved that the paper be referred to the Publication Committee if it did not arrive in time for its reading before the Society adjourned. It was so ordered.

The President read a telegram from Dr. Battey, of Rome, Ga., stating that he would not be able to make his promised visit to the Society.

The meeting adjourned till 10½ o'clock to-morrow morning.

Thursday, Second Day—Morning Session.

The meeting was called to order at 10½ o'clock by the President.

Dr. J. W. Jones, for the Finance Committee, made the following report:

The Committee on Finance report that, having carefully examined the Treasurer's books, they find:

Balance on hand, May 18, 1886	$457 17
Amount collected from members	479 00
Total	$936 17
Bills paid per vouchers	502 20
Balance on hand	$433 97

We recommend the assessment of $2.00 per capita, and the same salary to the Secretary and the Treasurer as before, to wit, to the Treasurer, $50; to the Secretary, $100.

J. W. Jones,
Robert Gibbon,
A. G. Carr.

On motion the report was accepted, and the committee discharged.

Dr. Joseph Graham offered the following report from the Committee on Credentials, and on motion the report was received:

Drs. James M. Dunlap, Ansonville; R. W. Tate, Greensboro; David

McBryde, Maxton; J. D. Croom, Maxton; E. C. Register, Enochville; W. C. Ramsay, Monroe; Alpheus Fields, Kinston; Alexander Capehart, Roxabel; J. G. Christian, Montgomery county.

Dr. O'Hagan stated that Dr. H. O. Hyatt was desirous of renewing his connection with the Society. He said that several years ago Dr. Hyatt had offered his resignation and it was not acted upon, some of the members thinking that he might see reasons for changing his intention. He did not, however, and when his resignation had been sent in to each of the next two meetings, some member said that he could not resign because his dues were not paid, and moved that his name be dropped from the roll. While such a record may appear on the books and is technically correct, it is, nevertheless, morally unjust. He moved that Dr. Hyatt be reinstated on the payment of his dues.

The motion was seconded by Drs. Satchwell and McDonald, both of these gentlemen speaking in complimentary terms of Dr. Hyatt.

The President asked if this matter was brought up on Dr. Hyatt's request, stating that while he was willing and desirous that Dr. Hyatt should return to the Society, he was unwilling for the Society to voluntarily invite him back.

Dr. O'Hagan explained that it was done at Dr. Hyatt's earnes request.

Dr. Haigh stated his understanding of the matter to be only an expression by the Society of its willingness to receive Dr. Hyatt as a member, not that it should make him a member.

Dr. G. G. Thomas called attention to the fact that the motion was for the *reinstatement* of Dr. Hyatt, and not for his *election* to membership.

Dr. Carr thought Dr. Hyatt could not join the Society without being present and signing the Constitution, and moved to amend the motion to that effect.

The Treasurer explained that the record shows that Dr. Hyatt resigned in 1879 and was reinstated in 1882 on the payment of $5.00.

Dr. Thomas asked if this last amendment, if adopted, is equivalent to a ruling that when a member is dropped for the non-payment of dues that he is to sign the Constitution before he can be again known as a member?

Dr. McDonald thought it was the intention of the motion that the Society only express its willingness to receive Dr. Hyatt back into its membership.

Dr. Long thought Dr. Hyatt occupied the same position as any other physician in good standing who was not a member of the Society, and thought that his name should not be acted on in this way, as the Society is supposed to be always willing to receive a physician in good standing. He thought Dr. Hyatt's name should come through the regular channel of the Committee on Credentials.

Dr. O'Hagan then called for the question on his motion, which was offered in the following language: "Moved that Dr. H. Otis Hyatt be reinstated to membership in this Society on making a personal appearance before it and signing the Constitution and By-Laws."

The motion, as thus put, was carried.

Dr. Payne requested the Committee on Nominations to observe the golden rule of rotation in office, and not nominate him as Treasurer for the ensuing year. He thanked the Society for courtesies shown him.

The next order of business being the discussion on subjects previously announced, Dr. W. P. Beall, appointed as Leader of Debate, announced as the subject for

DISCUSSION

"Are the Dangers of High Temperatures in Acute Diseases Overestimated?"

He said in all medical progress there invariably springs up theories, and these theories are at once seized upon by workers who endeavor to establish or disprove the theory, and out of all this work grows the crystalization of certain theories which are received and accepted, or it falls to the ground and is no more remembered. Among these theories is the danger of high temperature in acute diseases.

Fries in 1853 or 1854 popularized the idea that the application of cold in fever was a valuable therapeutic remedy. He was an enthusiast, and claimed that it was almost a universal panacea, and as time went on he became more and more pronounced in the application. Then came Liebermeister, with quinine, and also recommended Fries' treatment, but if he were restricted to the use of one he would take quinine. Following that idea our patients in acute diseases have been cinchonized as soon as the temperature has gotten beyond 101° or 102°, and the idea seems that the temperature is the one thing to be considered in all diseases, and if that can be kept down other symptoms could be regarded as of minor importance. He thought that a

healthy reaction was springing up in this matter of reducing temperature at all hazards, and the fact is being admitted on all hands that fever itself is not a disease—it is merely one of many symptoms. He thought that the experience in this country has shown that many eases of typhoid fever and others, in spite of cold baths and quinine, have ended fatally—or should he say, on account of these agents—and that relapses have become more common since this antipyretic treatment has come into vogue. The existence of so many antipyretics shows they are all unsatisfactory. He thought we were losing sight of the fact that the fever is not the disease. Fever is deemed now, he believed, to be a neurosis, and the so-called germs of disease are considered the primary cause of all acute troubles and the fever is only one of these symptoms. The experience of all of us shows that one patient will bear a temperature of from 101° to 104°, and will make a good recovery with or without antipyretic treatment, while in another much more dangerous symptoms manifest themselves with the same temperature range and treatment; yet the former should be considered the more dangerous case. In a recent discussion in the New York Academy of Medicine, Dr. Loomis and numerous other lights of that Society arrived at the conclusion that antipyretic treatment as a means of curing disease is a failure, although they did not state it in such absolute terms. When called to see a case of typhoid fever, for example, if we lose sight of the fact that the high temperature may be due to the excitement of the system brought on by disease germs, and pour into the patient quinine in large d ses, we do harm. Quinine in antipyretic doses is a heart paralyser, and we run great danger in giving these large quanti ties. Antipyrin, according to Dujardin-Beaumetz, destroys the blood corpuscles, and, while the most harmless of antipyretics, checks secretion, cutaneous transposition and is apt to do more harm than good. The comfort of the patient may be enhanced by the use of these remedies, but he objects to their indiscriminate use. We are tending too far towards the extreme in the use of antipyretics. In ordinary acute disease by keeping the emunctories active, especially the kidneys, we can attain a more satisfactory condition for the patient than will ensue by temperature reduced by medicines.

Dr. Bullock mentioned the case of a lady who died in his house from typhoid fever, whose temperature, notwithstanding enormous doses of quinine continued to rise and increased after death, until, fifteen minutes after breath had left the body, it reached 106¾° F.

Dr. O'Hagan thought that the hyperexia in acute diseases was an important point to be combatted. He defined pyrexia as being a temperature ranging to 103° F.; anything above that he would class as hyperexia. This matter has received much attention of late years, and the general line of thought has been to localize the origin of excessive heat in the nervous centers, the pons and medulla oblongata being the nervous center of heat production. In all these diseases we find that death takes place at the heart from paralysis, and that paralysis is produced, to a great extent, by the hyperexia, and we must combat that fatal result. He did not approve of the extreme treatment of the German physician who plunged the soldiers into baths of a temperature of 30 or 40°. He had read Liebermeister on quinine as an antipyretic, but that would not do here. There is vast good to be accomplished by holding the pyrexia within the danger line. You diminish the tendency to death by keeping the fever within this point. When the great London physician sat by the bedside watching the temperature fall without medicine, he found his patient got well. That case of pyrexia did an inestimable service to the profession. He proved that nearly all these diseases run a definite course. The deduction from this was that all physicians ought to do something to sustain life and prevent any symptoms from assuming such dimeusions as will cause changes in the body which will be dangerous to life. He has never seen any benefit from heroic doses of quinine, but has seen much harm. He thought there was sometimes a vast amount of good to be derived from water. The brain suffers from the pyrexia, then the extraordinary tension and effort by the heart causes danger of cardiac paralysis and thereby death. One of the most important things is to preserve that organ in its integrity. When the temperature is within 103 he avoids physic as much as possible and keeps it within this limit, letting the disease run its course, for this it will do. We know that antipyretics will not abort the fever, but they will keep it in bounds. He favored the application of water to the outside of the body. In regard to the temperature rising after death, he could not give a correct answer, but knew it to be a fact. He mentioned a case of typhoid fever which kept at a temperature of 108° for several days, and recovered in spite of him.

Dr. Cullen mentioned the case of a patient in which the temperature remained at 107½ for forty-eight hours. There was treatment

neither by cold bath nor by quinine. Said that he often had the temperature in surgical operations to reach 105 or 106°. For a long time he forbade the use of quinine in typhoid fever. Mentioned the case of a boy fourteen years old in which the fever held on for three weeks with temperature at 104 or 105. Gave him antipyrin very cautiously in eight-grain doses, warning the mother to notice if he had sweat and rapid pulse. He was soon sent for again, the mother saying he broke out with a profuse sweat shortly after his departure, and she was afraid he would die. Found him in a cold perspiration, pulse almost gone and lips blue. Used hypodermic injections of whiskey to bring him round. He did not think you could abort the fever with cold water, but you can keep it down. What is gained by keeping down the temperature? If you gain a respite of only twenty-four hours, it is valuable. You excite a typhoid fever patient by putting him into the bath. He always sponges his patient. It has a soothing effect on the nervous system, makes the patient passive, puts him to sleep and does as much good as a cold immersion in water at 68° or lower.

Prof. Dabney said he was fully in accord with Dr. O'Hagan. He thought that fever may be due to two chief processes—that is, an excessively high temperature—to defective heat loss or to excessive heat formation. Now, it is rendered certain by the experiments of late years that in the vast majority of cases of hyperexia there is an excessive formation of heat, and that this is due to oxygenation. Why? Because these experimenters weighed carefully the amount of urea discharged, and also estimated the quantity of carbonic acid gas and found there was an increased amount of both. It could be due only to excessive oxygenation. So our treatment should be, in those cases where the skin is bathed with sweat, showing that the heat loss is abundant, to give remedies which will check the formation of heat. First, as to the danger of hyperexia. He has no doubt that a temperature over 103° calls for some treatment. He considered pyrexia to be below 103°, and anything above that hyperexia. In these cases of hyperexia remedies are needed. He has given antipyrin several hundred times—a good many times in his own family, and has seen a single case of collapse. Mentioned the case of a lady who had puerperal toxæmia. Gave the dose recommended by Dulany of thirty grains, and told the nurse if, at the end of one hour the temperature remained at 105, to give an-

other dose of 30 grains. Nurse gave second dose without taking temperature, and on returning he found it at 95, with pulse 40. This case ended favorably. The dangers of collapse are slight. This is the only antipyretic which does not produce cardiac failure. Parenchymatous degeneration of the heart muscle is not due to high temperature, but there is no question that this hyperexia tends to cause heart failure. He has tried quinine, given in large doses, but was not satisfied with the effects. Has tried salicylic acid, but of all antipyrin has been the most satisfactory. The dose of 30 gr. + 30 + 15, as recommended by its great champion, Dulany, is too much. Fifteen or twenty grains, repeated in one hour, will almost invariably reduce the temperature two or three degrees and keep it down for twelve hours. Has never seen it kept down under antipyrin twenty-four hours, but has for twelve hours time and again. His rule has been to give it in 15 or 20 grain doses whenever the temperature gets above 103°. He has not had much experience with cold water. Has tried the cold sponging and likes it exceedingly. He tried wet pack in the case of a young lady found unconscious in bed with a temperature of 109°. On using the catheter he found a small quantity of highly albuminous urine in bladder. She was put in wet pack, but died in two or three hours. When you lessen the calibre of the blood-vessels in the skin you throw more blood on the internal organs, thereby augmenting the danger of hæmorrhage from the bowels, and this he regarded as an argument against external use of cold water. He said he had found antipyrin valuable as a styptic. It lessens very much the danger of hæmorrhage. He does not use antipyrin till the temperature reaches 103°. There is no hyperexia till that point is passed; below that the fever is attendant upon many diseases.

Dr. D. B. Frontis asked if we cannot use some measures for reducing the temperature which will have some therapeutic effect other than that. He did not think it best to treat hyperexia for itself alone. So far as known to him no other therapeutic effect is claimed for antipyrin than the reduction of temperature. But there are two classes of cases where it has other effects. In the hyperexia of malarial fever antipyrin contracts the vessels of the viscera more than the peripheral vessels. He thought for that reason it would give good results in that disease. He spoke of the hyperexia from indigestion. In this we may relieve the intestine, or think so, and

go as far as we can in counteracting that trouble, and yet the temperature remains high. One full dose of antipyrin will reduce the temperature, and probably that will be the last of it, since the cause has been removed. It has a valuable effect upon the nerves and nerve centers. He does not think it fair to consider quinine only as an antipyretic. It has, unquestionably, a therapeutic effect as an antiseptic, and it has a controlling power over inflammation whenever and wherever it exists. He has been using antifebrin for the past three months, and draws the conclusion that it does not act so quickly as antipyrin, but is far safer. He has never had any alarming effects in chills. It produces a good deal of perspiration, but it comes on slowly. When the temperature rises again we do not have the initiatory chill.

Dr. Booth called attention to two facts in relation to disease—one, that it is the intrinsic tendency of every animal economy to throw off disease; another, that the destructive metamorphosis comes on more rapidly in a high temperature than in a low one. In the treatment of typhoid fever if we will keep the temperature down and prevent this destruction and sustain our patient, he will get well. It has been the custom to treat typhoid fever by supporting the patient, preventing excessive diarrhœa, and thereby lessening the risk of perforation of the bowels, etc. Recently we find we can lessen the duration of that disease by giving antipyrin. He believes quinine in typhoid fever does a great deal of harm. The duration of the disease is four, five or six weeks, but the administration of proper doses of antipyrin will shorten this time. He believes he has aborted many cases of pneumonia with antipyrin. The main point he wanted to make was that in cases where we do not know what causes the trouble, if we sustain the patient and keep the temperature down he will get well ordinarily.

Discussion was here postponed to give place to the conjoint session with the North Carolina Board of Health.

Dr. Graham introduced to the Society Dr. McAden, who had come as a delegate from the Druggists' Convention.

Dr. McAden stated that at the last session of the State Pharmaceutical Association the question was raised as to the best plan to prevent druggists from prescribing for patients—that it was trespassing on the domain of the physician. In that discussion a

resolution was offered and a committee appointed to present it to this State Convention.

The resolution is as follows:

Resolved, That T. C. Smith, L. R. Wriston and J. H. McAden be appointed as a committee to wait on the Medical Convention at Charlotte, next year, and request that body to discourage the practice on the part of physicians of selling medicines—thus encroaching on the domain of pharmacists and affecting their business injuriously. This Association will endeavor to prevent its members from interfering in any way with the practice of physicians.

In presenting the resolution he said that the committee, who were all residents of Charlotte, had no complaint to make against any physician there; each physician and each druggist stands legitimately upon his own territory.

On motion of Dr. Summerell, the Chair appointed a committee of three, consisting of Drs. R. L. Payne, W. J. Jones and S. D. Booth, to take into consideration this resolution and make a report to this Convention at a future hour.

The Secretary read an invitation from the North State Club for the members of the Society to visit their rooms.

CONJOINT SESSION

with the North Carolina Board of Health was called to order by Dr. J. W. Jones, of Tarboro, President of that body.

As first in the order of business, Dr. Jones read his Annual Address.

Next in order was the election to fill the vacancies caused by the expiration of the terms of Drs. R. H. Lewis and R. L. Payne.

It was voted that these vacancies be filled one at a time, and Dr. O'Hagan put in nomination Dr. R. H. Lewis, of Raleigh, saying that Dr. Lewis had been one of the hardest workers and most useful members of the Board of Health.

Dr. Lewis was unanimously elected by a rising vote.

Dr. Long nominated Dr. R. L. Payne, and the nomination was seconded by Dr. Joseph Graham.

Dr. Payne was unanimously elected to succeed himself, but rose and said that while he felt highly honored by the action of the house, he would ask to be allowed to decline. He had been a member of the Board for eight years, and asked that some one younger and more capable should be put in his place.

Dr. Payne's resignation was accepted with regrets, and Dr. H. T. Bahnson, of Salem, being put in nomination was unanimously elected to the position.

The President announced that there were two or three interesting papers to be read, and at his request Dr. S. S. Satchwell read a paper on "The Drinking Waters of Eastern North Carolina."

Dr. Lewis rose to make an acknowledgment of the services of Mr. Henry E. Fries and Dr. J. H. Stancill, members of the last General Assembly, in looking after the interests of the profession during the last session of the Legislature. He wished the Society to know to whom it was indebted for the safety of the laws affecting its interests.

It being now the hour for the noon recess, on motion of Dr. Graham the Conjoint Session adjourned till 3½ o'clock P. M.

Second Day—Afternoon Session.

The Conjoint Session was called to order by Dr. Jones, President of the Board of Health.

Following the order of business from the morning session, Prof. W. G. Simmons, of Wake Forest, read a paper on "Illuminating Oils."

Dr. McDonald moved that Prof. Simmons' paper be referred to the Publication Committee, and that a committee be appointed to take steps looking to suppressing the sale of these low-grade oils in the State. Carried.

Dr. Haigh said that at the last meeting of this body, when an uncompleted paper was read on this same subject, he suggested that our people ought to be protected against these low-grade oils by the publication of these facts. This was not done on account of the incompleteness of the paper. It seemed to him that the time had now arrived when some publication of that sort should be made. Our Board of Health must show the people that we are working for their good. Here is the fact of the daily use of absolutely dangerous oils by hundreds of thousands of our citizens. With this knowledge before us, is it not our duty to publish these facts? The names of these oils, of the manufacturers and of the sellers should be published, that the people may know what they are doing. It is the only way in which an attack can be made on these

manufacturers in the absence of a law, and we would have to wait now two years nearly before such a law could be created. He moved that, as far as it is possible, these facts be published in the newspapers.

Dr. McDonald thought when these facts are brought before the Legislature in the proper way something will be accomplished.

Prof. Simmons stated that the samples had all been obtained from retail dealers, and he was unwilling to hold the manufacturers or perhaps the wholesale dealers responsible unless there was some way by which the identity of the oil could be traced back. The retail dealers could only trace the oil back one step, viz: to the wholesaler. He thought the proper place to apply pressure was on the sale of the oils.

Dr. Haigh thought if our State chemist could publish to the world the analyses of different fertilizers, with their brands, he saw no reason why these facts, which are of so much more importance, should not be.

Dr. R. L. Payne, of Lexington, read a paper entitled "Some Preventable Causes of Disease Among Females."

On motion of Dr. Graham, Dr. Payne's paper was referred to the Publication Committee.

On motion the Conjoint Session adjourned.

The Medical Society was called to order, President Bahnson in the Chair.

The order of business was the continuation of the discussion which was postponed from the morning session to give place to the Conjoint Session.

On motion of Dr. Haigh, the time of debate was limited to five minutes for each participant.

Dr. Hays stated that Dr. White, of Richmond, would have to leave for home on the morning train, and moved a suspension of the regular order of business to allow Dr. White to read a paper which he had prepared.

Dr. Graham offered the following report from the Committee on Credentials, which was received by vote :

Drs. J. A. Ardrey, Pineville; D. C. Parris, Hillsboro; J. M. Lawing, Lincolnton.

Dr. Hays' motion was carried, and Dr. White read an able paper on "Reflex Eye Troubles."

On motion of Dr. Hays the thanks of the Society were tendered Dr. White for his paper, and the paper referred to the Publication Committee.

Dr. Hays said he had prepared and circulated, to some extent, a paper which had been signed by some twenty-five persons, including our prominent visitors. The paper was a pledge on the part of the subscribers to furnish at least one original communication to the North Carolina Medical Journal within the next twelve months.

Dr. Long offered the following resolutions:

Whereas, The membership of the Society is getting to be so large that, in the present plan of organization, only slight recognition, or none at all, is possible to the great majority of members in the assignment of duties to be performed or offices to be filled; and whereas, it is to the best interest of the Society that some increase in the number of appointments for scientific work during the year should be made, therefore be it

Resolved, That the Society should be so arranged that each member shall be placed in one of the several sections, and the chairmen, as at present appointed, be chairman of these sections.

Resolved, That immediately after the adjournment of each annual meeting each chairman shall select such members as he may see fit to read papers on subjects relating to his section.

Resolved, That each chairman shall notify the Secretary as soon as possible in order that a programme may be prepared and published in advance of the meeting.

Resolved, That a certain time of each annual meeting shall be allotted each section, and all papers pertaining to such section be read at that time.

Resolved, That at the meeting of each section the chairman of the section shall preside with the President.

Resolved, *further*, That a committee of five be appointed to consider the advisability and practicability of the above changes in the plan of organization, and be instructed to devise suitable regulations for carrying them out, if deemed advisable; said committee to report at the next annual meeting.

Dr. W. J. Jones understood the object of the resolutions to be that a change might be effected in the present unsatisfactory manner of getting reports from the chairmen of sections. He deplored the fact that at this meeting only one report had been read; and if the young members come here a few times and hear only one or two essays read and then referred to the Publication Committee with no discussion—or perhaps read "by title" only, and referred—they will soon lose interest in the meetings and think they had better spend

their time in a more profitable way at home in attendance upon their patients.

Dr. Graham rose to a point of order, saying the resolutions involved a change in the Constitution and must lay over till another meeting before being discussed.

Dr. Lewis moved that a committee of three be appointed to consider the resolutions as to making such changes as may seem necessary, and report at the next meeting of the Society.

Dr. Lewis submitted the following report of the Committee on the President's Message :

Mr. President:—Your Committee, after carefully considering the admirable address of our President, express the hope that each member of the Society will, after its publication, give it a thoughtful reading and lend his efforts to carrying out the many wise suggestions made therein. They would especially recommend that the following be immediately adopted by the Society :

1. That the NORTH CAROLINA MEDICAL JOURNAL be declared the official organ of the Society; that its editors be *ex officio* members of the Committee on Publication, and that an edition of 800 copies of the "Transactions" be published within sixty days after the month in which the meeting is held.

2. That the Secretary be instructed, by correspondence with some member in each county, to revise the present list of members, and after revision to record the same in the order in which they joined the Society, with the year of admission placed opposite each name, instead of alphabetically, as now.

3. That licensed or otherwise eligible physicians, desiring to unite themselves with us, but who may be prevented from attending in person, be allowed, upon application in writing, to do so upon the endorsement of two reputable members of the Society, one of whom must be present and sign the Constitution and pay the initiation fee for them.

Respectfully submitted,

R. H. LEWIS,
JOHN MCDONALD,
C. M. POOLE.

Dr. Satchwell moved the adoption of the report as a part of the Constitution of the Society.

Dr. Booth thought that portion concerning the admission of members into the Society involved a change of the Constitution

and would have to lay over. At the same time it could be adopted at this meeting by an unanimous vote. He moved that the report be read and acted on by sections, which motion was carried.

The first clause being read was adopted, only one voting "no." This section did not involve a change in the Constitution.

The second clause was adopted unanimously.

The third clause being read, was amended to read as it appears above, and was then unanimously adopted.

Dr. Graham offered the following report from the Committee on Credentials, which was received:

Drs. Buxton B. Williams, Warrenton; J. C. B. Justice, Leicester; Robert W. Winborne, Barnitz; John L. Ray, Burnsville; John W. Neal, Meadows.

Dr. Summerell, from the Nominating Committee, made the following report:

The Committee on Nominations would make the following report:

For President—Dr. T. D. Haigh, Fayetteville.

Vice-Presidents—Drs. W. T. Ennet, Burgaw; J. B. Dunn, Raleigh; Thomas E. Anderson, Statesville.

Secretary—J. M. Baker, Tarboro.

Treasurer—C. M. Poole, Salisbury.

Orator—S. D. Booth, Oxford.

Essayist—W. C. Galloway, Snow Hill.

Committee on Publication—Drs. Thomas F. Wood, George G. Thomas, Wilmington; W. T. Ennett, Burgaw; J. M. Baker, Tarboro.

Board of Censors—Drs. George G. Thomas, W. J. Love and W. W. Lane, Wilmington.

Delegates to the American Medical Association—Drs. Charles J. O'Hagan, Greenville; E. H. Hornaday, Washington; J. H. Tucker, Henderson; Joseph H. Graham, Charlotte; John Whitehead, Salisbury; Eugene Grissom, Raleigh; T. S. Burbank, Wilmington; J. B. Gunter, Mebaneville; D. B. Frontis, Wadesboro; J. W. Faison, Mt. Olive; John K. Ruffin, Wilson; R. H. Lewis, Raleigh.

Delegates to the Virginia Medical Association.—Drs. W. T. Cheatham, Henderson; R. H. Stancell, Margarettesville; L. J. Picöt, Littleton.

Delegates to the South Carolina Medical Society—Drs. D. W. Bullock, Whitakers; Simmons B. Jones, Charlotte; Robert F. Gray, Winston.

Obituary Committee—Drs. S. S. Satchwell, Rocky Point; W. H. Lilly, Concord; A. A. Hill, Lexington.

Delegates to American Public Health Association—Drs. J. W. Jones, Tarboro; W. D. Hilliard, Asheville; G. W. Graham, Charlotte

On motion the report was received.

It was voted that the Cons itution of the Society, as amended, be published in the next number of the "Transactions."

On request from the Secretary it was voted to print 250 extra copies of the Constitution for his use in supplying them to applicants.

By request of Dr. R. L. Payne, Dr. A. G. Carr was appointed to take his place on the committee to confer with the druggists.

Dr. Satchwell, as Chairman of the Obituary Committee, asked the members having any information concerning deceased members to send such information to him at as early a date as possible.

Dr. Graham asked permission to exhibit a specimen of the result of the application of the dry earth treatment to the internal surface of the vagina and the general application of this substance in the treatment of other diseases and injuries. He remembered having heard of this treatment while a student in Philadelphia.

Dr. Summerell mentioned having used an earth, manufactured in Baltimore, in his practice at the poor house in his county. He used it successfully in four cases of sore legs which had resisted all other treatment for years. These cases got well in two or three months. Where the sores were excavated the cavity was gradually filled up, and when the granulations appeared cicatrization went on as in ordinary sores.

On motion of Dr. Haigh the thanks of the Society were tendered Dr. Graham for his interesting clinical report.

Dr. Barringer said he had tried it in several cases with perfect result and rapid healing. He had seen the epidermis taken off the skin by an application lying on twenty-four hours. He has had the idea that it is a vesicant and a dessicant. A vesicant will lift up the tissue and leave a fluid serum beneath, but with both combined this serum is absorbed.

Dr. Graham promised to give his experience with this treatment

more fully, to the profession, through the columns of the NORTH CAROLINA MEDICAL JOURNAL.

Dr. W. P. Beall concluded the discussion on hyperexia, postponed from the morning session, by protesting against the interpretation of the subject by Dr. O'Hagan. His idea was that high temperature in acute diseases was held in too high esteem in comparison with other phenomena—that our attention had been devoted to relieving the high temperature, and not to the seat of the disease, and it was this he wished to call attention to.

Dr. Carr asked the opinion of the Society as to our autumnal fevers They were called by some physicians typhoid, while others classed them as typho-malarial. In the absence of the characteristic typhoid temperature—a regular increase of one degree each day for a week, then remaining for a week at about 104°, the third week remittent in character and the fourth intermittent, he calls it typho-malarial, notwithstanding the fact that some persons disclaimed the existence of such a disease. In these fevers the highest temperature reached will be about 103° or 104°, and this was present at his first visit.

Dr. Long thought these fevers should be classed as typhoid.

On motion the discussion was postponed to the morning session.

The President appointed on the committee to take into consideration Dr. Long's resolutions Drs. G. W. Long, J. M. Hays and P. B. Barringer.

On motion the meeting adjourned till 8½ P. M.

SECOND DAY—EVENING SESSION.

The meeting was called to order by the President at 8½ o'clock.

Dr. T. T. Robertson, of Winnsboro, South Carolina, was introduced by the President, and responded very pleasantly.

The Chair then introduced Dr. J. M. Hays, the orator of the evening, who delivered most acceptably the Annual Oration. Many ladies and citizens generally were present on the floor and in the galleries.

On a call from the President for the report of the Committee on Prize Essays, Dr. R. H. Lewis, from that committee, said the committee had received two essays, one signed "Hannibal;" the other "Medicus." The committee had decided to award the prize to the latter.

He read a letter from Dr. Charles Duffy, Chairman of the Committee on the Pittman Prize, saying that this essay had been presented in competition for that prize, but the author becoming known to him, they had decided to send it in competition for the Society's prize. It had not reached the committee four weeks before the meeting, but they had decided not to enforce this clause under the circumstances. Upon opening the sealed envelope accompanying the essay, they found the name of Dr. Francis Duffy, of New Berne. He added that the committee regarded the essay as a most excellent production, and thought the Society would be interested in hearing it read. He said Dr. Duffy had requested him to say that, instead of taking the prize, he would ask to offer it again as a prize for the best essay on "The Treatment of Hæmorrhagic Malarial Fever," to be presented at the next meeting of the Society. He will make known to the Secretary the conditions on which he offers the prize.

On motion of Dr. Lewis, Dr. W. J. Jones was requested to read the Prize Essay.

Dr. Jones was escorted to the rostrum by Dr. A. G. Carr, and performed the duty assigned to him in a most satisfactory manner.

On motion the paper was referred to the Publication Committee.

The President said he held in his hand the sum of $50, to be awarded, in accordance with resolutions passed at the last meeting, to the author of this paper, and requested Dr. McDonald to escort Dr. Duffy to the rostrum.

In presenting the prize, Dr. McDonald said: "Let me, my dear sir, in the name of the North Carolina Medical Society and as the agent of this committee, tender you this sum as a testimony of their high appreciation of the manner in which you have performed this voluntary work, and let me hope that your example will be followed by others of the Society."

Dr. Duffy received the money, expressing his sensibility of the high honor conferred upon him, and immediately handing it back, said he wished to offer the amount as a prize at the next meeting of the Society, as explained by Dr. Lewis.

Dr. Lewis said he had made one omission in what he had said for the committee. They regarded the unsuccessful essay as a most excellent and valuable paper, and requested the Secretary, if he should discover the author, to ask him to give it to the profession

through the columns of some medical journal. He moved that the thanks of the Society be tendered Dr. Duffy for the money he had donated, and that it be offered as a prize for an essay on the subject named by him. Carried.

The Secretary read a telegram from Dr. Pittman establishing the "Pittman Prize" for the remainder of his life.

On motion of Dr. Lewis, it was voted to transmit to Dr. Pittman the thanks of the Society for his munificent liberality in continuing this "Prize" during his lifetime.

On motion of Dr. Hays, the Committee on the "Pittman Prize" were empowered to award this prize if, on their examination of the essays, any one was deemed worthy of it.

Adjourned till to-morrow at 10½ o'clock.

Third Day—Morning Session.

The meeting was called to order at 10½ o'clock.

Dr. George G. Thomas presented the report of the Obituary Committee, appointed to take notice of the deaths of members since 1881.

On motion the report was adopted.

Drs. Lewis and Thomas expressed to the Society their appreciation of services rendered by Dr. J. H. Stancell while a member of the last Legislature.

Dr. W. C. Ramsay rose to make to the Society his excuses for being absent from the meetings for several years past, and expressed the hope that he would never be kept away from another.

The Secretary read the following resolution from Dr. J. J. Summerell:

Resolved, That the North Carolina Medical Society have heard with great pleasure that our distinguished and long loved member, Dr. Thomas F. Wood, though still on his bed of suffering, is improving; and, while expressing to him personally our deepest, tenderest sympathy in his trial, we utter the hope that God may yet spare him to take again his accustomed place of usefulness in our annual meetings, and that many years of efficient work and honor may yet be his.

Dr. O'Hagan said there had been no resolution offered to the

Society which would so heartily meet their approval as this. There was no one there, perhaps, to whom Dr. Wood was not known, and where he is known he is honored. It was a matter of most profound interest to him and the Society to know that Dr. Wood was improving. He wished it were in the power of the Society to appoint a committee to wait upon Dr. Wood and express to him the kindly feelings of the Society.

Dr. Summerell's resolution was adopted by a rising vote.

The President said it had been his pleasure to correspond with some of the older members of the Society and many other prominent persons. He read a portion of a letter from Dr. Otis F. Manson, of Richmond, Va., offering to the Society, for its "Transactions," his paper on "Hæmorrhagic Malarial Fever," just completed. On looking over the laws of the Society he found that it had been made an inflexible law not to receive a paper at second-hand. He took the liberty of writing this statement to Dr. Manson, that, while the Society appreciated in the highest degree his kindness in offering the paper, if they accepted it they would be establishing a very embarrassing precedent. He said Dr. Manson had sent some copies of this paper, and also one on "Sulphate of Quinine," for distribution among the members, and these could be obtained from the Secretary. He read letters from Drs. N. J. Pittman, John A. Wyeth, New York; Hunter McGuire, Richmond; W. T. Howard, Baltimore, and Will. George Thomas, Wilmington.

Dr. R. H. Lewis, Raleigh, read a paper entitled "Some Practical Reflections on Foreign Bodies in the Ear."

Dr. Thomas moved, with pleasure and gratitude to the author, that the paper be referred to the Publication Committee. It was so referred.

Dr. Booth, in commenting on Dr. Lewis' paper, suggested as a good substitute for a hook a common surgeon's needle, the point of which, when drawn across a hard surface, is turned up. He has found this very convenient for rolling the foreign body (in the great majority of cases a seed of some kind) from the ear.

Dr. Poole read a report of a case of "Quinine Amblyopia."

Dr. Lewis mentioned a case somewhat similar to that of Dr. Poole's, but in his case the trouble was caused by malaria, and not quinine. It was the case of a young man who, in an attack of malaria, not very severe, became absolutely blind, so that he could not see the sun. In

six days the blindness passed off entirely. A peculiarity of this case was that the attacks, of which he had had several, always came on a Thursday at 2 o'clock. There was no fever and no symptoms of malarial poisoning except this. The remedy used in this case was salicylate of soda in large doses.

Dr. Poole's paper was referred to the Publication Committee.

Dr. Balsley recited the case of a young lady in whom irregular menstruation was accompanied by suppression of the urine and unconsciousness and apparent blindness. The duration of these symptoms was from Monday until Saturday, during which time but little fluid was taken. The catheter was introduced several times, but no urine of any amount was found. There was slight delirium. She recovered on Monday, the eyesight returned rapidly, and in the course of two or three days was fully established. A week afterwards there was an abscess on the neck. During the early part of the attack he gave aloes and calomel, but after a day or two all medicine was withheld and efforts to sustain the patient constituted the treatment.

Dr. Patterson mentioned having had four cases of difficulty in respiration after labor. One of these died, the others recovered.

Dr. Booth attributed it to pulmonary embolism. A similar case in his practice developed into pneumonia, and the patient died with these symptoms very little improved.

Dr. Baker read a paper from Dr. W. J. H. Bellamy on the use of "Antipyrin in Croup," which was referred to the Publication Committee.

The President stated that the paper sent by Dr. Kollock had come to hand, and on request of the Society read it. The title of the paper was "Abdominal Section for Traumatism; Intestines Sutured, with Recovery."

Prof. Tiffany said the paper just read is almost beyond criticism. The result of the operation, he suspected, was largely due to the bravery on the part of the surgeon in performing the operation so soon and not waiting till traumatic peritonitis was present, as a result of a discharge from the wound and a bloody action from the bowels into the peritoneal cavity. He is worthy of all credit. It is extremely rare for the surgeon to have a bloody action from the bowels or a discharge of feces from the wound so soon, and these were valuable indications for the operation. He had never done an abdominal section for gun-shot wound of the intestine, but has treated in

the last few years two or three cases of the belly which have recovered. He had seen the bowel protrude from the wound, but did not think that a reason for doing abdominal section. When an effusion makes its appearance in the neighborhood it is an indication of peritoneal inflammation. He believes in a case of doubt it is right to open the belly. That is the teaching of to-day, and he thought it an improvement on the past. When the surgeon thinks the bowels may be wounded even without the signs the writer of the paper had, abdominal section will do no harm. He mentioned having done four abdominal sections. The first was for intestinal obstruction. The patient died, practically on the table. In the other three there was a different result. The first of these was exploratory. There was a tumor in the left side of the belly, and he did not know whether it was the spleen or kidney. He made an incision in the middle line, made the diagnosis and no harm was done. It was a tumor of the spleen. The next case was for peritonitis following perforation of bowel. That is somewhat in the line of gun-shot wounds of the belly. He made an incision into the right iliac fossa expecting to find an abscess. He did find one containing feces and much blood, and perhaps a half gallon of hot water was used to wash out the cavity. The belly did not go down as expected. The right side collapsed and general shape of belly was not what it should have been. The opinion seemed justified that the patient had suppurative peritonitis, and that adhesion had taken place between the general abdominal cavity and the right iliac fossa. He did laparotomy in the middle line from the umbilicus downwards, and he found the intestines floating in pus and serum. He emptied it as much as possible, and ran hot water through in large quantities. The child collapsed. He thought putting in hot water the best way of stimulating the patient in collapses after laparotomies, because he believed the collapses so commonly seen are due to chilling of the intestine. He called attention to the fact that the extent of surface of the peritoneum is about the same as that of the skin, and therefore capable of drawing off heat very rapidly when exposed to the air. The wounds were washed out with hot water several times daily. Feces came through both openings, showing that there had been escape of feces into the belly and that adhesions had formed. The child recovered. The third case was an abscess of the liver with a healthy peritoneum, and there was no trouble. He tapped through the chest just under the seventh rib in about the axillary line,

evacuated the abscess and waited again for the cavity to fill up He then did an abdominal section, placed a rubber tube in the abscess and fastened it in place, and the patient is now going about with the tube in his liver. Most cases of peritonitis do not generally become suppurative. The patient generally dies before that time. He advised the use of a plenty of hot water for cleansing the cavity, and that no food be given for several days. He did not think a better rule in surgery could be laid down than that in the paper read. If the operation is to be done at all, it should be done early. Use clean hot water. He does not think it necessary to have a large number of instruments to accomplish the result. The pocket-case contains all that is necessary in this operation. One thing of importance is the suture. It is extremely difficult to stitch up a wounded bowel. It is the most slippery of slippery things, and it should be held with the fingers, and not with an instrument. It is one matter with which the general practitioner should make himself familiar, and he advised that they should provide themselves with a few feet of the bowels of some animal and practice the stitch. The stitch should go through the serous and muscular layers, but not through the mucous, that, beside bringing serous surfaces into apposition, it may not come in contact with the intestinal contents. In practicing it himself in this way he found that it was a difficult thing to learn, and needed practice. He thinks this the only especial preparation necessary for the physician to have before attempting to suture a wounded intestine.

Dr. George G. Thomas, from the committee appointed to take into consideration Dr. White's resolution as to the establishment of an inter-State association, made the following report:

The committee appointed to consider the proposition made to this Society to enter into the organization of an Inter-State Medical Society, to embrace this and several other States, beg leave to report that they do not regard the proposed movement with favor, and respectfully recommend that this Society shall not enter into, or participate in, the formation of such a society as is contemplated in the motion submitted by Dr. White, of Richmond.

On motion the report was adopted.

Dr. Haigh rose to renew the invitation extended to the Society at the meeting in New Berne, that the next meeting should be held in Fayetteville. On that occasion he withdrew his invitation in favor

of Charlotte, on the understanding that the meeting of 1888 would be held in Fayetteville.

Dr. Haigh's invitation was accepted.

Dr. Lewis moved that the time of meeting be the same as this year—the second Wednesday in April.

Dr. O'Hagan offered an amendment substituting Tuesday for Wednesday, and inserting the words "at 10 o'clock A. M."

The motion, as thus amended, was carried.

Dr. George G. Thomas asked for himself and his colleagues on the Board of Censors to be relieved from that duty. For himself, he would have to decline, and both the other gentlemen had asked to be relieved.

Dr. Lewis moved the resignation of these gentlemen be accepted.

Dr. Booth offered an amendment empowering the President to appoint another Board of Censors.

The motion, as thus amended, was carried.

On motion the thanks of the Society were voted Dr. Otis F. Manson for his munificent gift of pamphlets.

The hour for the installation of officers having arrived, the President requested Drs. Thomas and Booth to conduct President elect Haigh to the Chair.

Before tendering the gavel to his successor, Dr. Bahnson said to the Society: "For the honor you have conferred on me I have already expressed, and wish to repeat, my hearty thanks. It is a pleasure to have wielded the gavel in an assembly such as this; and for your kind granting of my last request, that you bear with me; for the courtesy you have shown my inexperience; for the attention to my requests as President of the Society, I feel I owe you my individual thanks. It is with scarcely a diminution of the pleasure I have experienced that I now introduce to you your President, Dr. T. D. Haigh."

Dr. Haigh said: "Fellow members, for the double honor you have conferred upon me in selecting me as your President for the ensuing year, and by honoring me before my own people in appointing my place of residence as the point where you will assemble next year, I heartily thank you. I will not attempt—I fear to attempt to express the feelings that stir me at this moment. But let me say that if my actions shall in any measure keep pace with the love I have for you all and for this Society, I shall not fail

to come up, in some measure, to the point that your leader should take in the ensuing year. Again I thank you, and will be glad to see you all when me meet again, next year, in Fayetteville."

On motion of Dr. Payne, it was voted to pay the stenographer $25 for his services.

A vote of thanks was tendered the citizens generally, and especially the profession of Charlotte, for kindnesses to the Society during the session.

Adjourned till 3½ o'clock P. M.

Third Day—Afternoon Session.

The meeting was called to order at 3½ o'clock.

The President announced the following chairmen of sections for the ensuing year;

Practice of Medicine—Dr. Simmons B. Jones, Charlotte.

Obstetrics and Gynæcology—Dr. S. T. Nicholson, Washington.

Microscopy and Pathology—Dr. H. W. Lewis, Jackson.

Surgery—Dr. P. B. Barringer, Davidson College.

Medical Jurisprudence—Dr. R. F. Gray, Winston.

Materia Medica and Therapeutics—Dr. J. H. Way, Waynesville.

Dr. Graham, from the Committee on Credentials, reported the name of Dr. W. P. Craven, Mecklenburg county.

The name of Dr. J. C. Gidney was presented for reinstatement, being reported as having been dropped for the non-payment of dues.

Dr. Payne thought that members who had been receiving the "Transactions" regularly should pay all back dues.

Dr. Bahnson said that during the time he had served as Treasurer there was a direct ruling on this subject and the Society ordered that any old member could be admitted on the payment of three years' dues. He called attention to the necessity of codifying all such rulings of the Society, and moved that the Secretary be empowered to employ some competent person to codify and properly index all rulings and orders of the Society and have the same printed.

The motion was carried.

Dr. Young moved to reconsider the motion fixing the time of the next meeting on the second Tuesday in April. His reasons for this

were that there are one or more medical colleges, which do not graduate their classes until May, and the present arrangement would require these graduates to wait a year before they could get their licenses.

The motion was carried.

Dr. Young then moved that the Society meet next year on the second Tuesday in May. Carried.

Dr. Graham mentioned a case of pulmonary phthisis treated by inhalations of turpentine, resulting in lessening the amount of sputa and improving the general condition. He was more than pleased with the treatment. The cough had decreased more than one-half. The patient carries the apparatus in his pocket and uses it several times a day, consuming about half an ounce of turpentine daily. It does not affect the kidneys or irritate the mucous lining of the larynx.

Dr. Payne mentioned a case in which an eruption followed the administration of chloral hydrate, and subsided on the discontinuance of the treatment.

Dr. Graham had noticed that the long-continued use of chloral would cause an eruption around the nails.

Dr. Bahnson presented the following resolutions :

Resolved, That this Society recognize, with unfeigned pleasure, the assistance rendered by the press of the State to the Medical Society of North Carolina in its efforts to elevate the standard of medical education, and we are proud to acknowledge our obligations to these enlightened educators of the public.

Resolved, That the thanks of the Society are hereby tendered to the papers of Charlotte for their efforts to make this meeting a success.

On motion the thanks of the Society were voted to the railroad and various corporations, the physicians and Academy of Medicine, and all those who, in public or private capacity, helped to make this meeting so pleasant. Also to Mr. Atkinson for the delightful entertainment at the Charlotte Female Institute to which the Society was invited.

Dr. Bahnson was allowed to amend his motion as to the printing of all rulings of the Society by adding the words "and published with the 'Transactions' of the Society."

On motion the Secretary was empowered to have bound all back numbers of the "Transactions."

The President appointed on the Committee on "Pittman Prize" Drs. P. E. Hines, Hubert Haywood and R. H. Lewis, Raleigh.

He appointed on Committee on "Duffy Prize" Drs. J. J. Summerell and Whitehead, of Salisbury, and Beall, of Greensboro.

Dr. Summerell asked to decline, but on special request of the President consented to serve.

On motion the meeting adjourned to meet in Fayetteville on the second Tuesday in May, 1888.

Award of the "Pittman Prize."—The Committee to award the "Pittman Prize" of one hundred dollars have given their preference to the essay of Dr. Julian M. Baker on "Hemorrhagic Malarial Fever." The Journal wishes to offer its congratulations to Dr. Baker for this vote of esteem on the part of the Committee.

ANNUAL MEETING OF THE BOARD OF MEDICAL EXAMINERS OF THE STATE OF NORTH CAROLINA.

Charlotte, N. C., April 11, 1887.

The Board of Medical Examiners of North Carolina convened in the Central Hotel at 9 o'clock A. M. April 11th, 1887.

The following members were present: Dr. Wm. R. Wood, President and Examiner on Chemistry and Pharmacy; Dr. W. J. H. Bellamy, Secretary and Examiner on Materia Medica and Therapeutics; Dr. A. W. Knox, Examiner on Obstetrics and Diseases of Women and Children; Dr. P. L. Murphy, Examiner on Anatomy; Dr. James A. Reagan, Examiner on Physiology and Medical Hygiene; Dr. Frank Duffy, Examiner on Surgery, Surgical Pathology and Diseases of the Eye and Ear; Dr. Willis Alston, Examiner on the Practice of Medicine.

After the reading and approval of the minutes of the last meeting and transacting other important business, the names of forty-eight (48) applicants for license were recorded. As a result of the examinations, which were continued from the 11th to the 15th inst., the following thirty-four (34) gentlemen received their licenses to practice medicine in North Carolina:

Dr. William B. Henderson, Hopewell, Mecklenburg county.
" William S. Davidson, " " "
" Henry L. Abernethy, Hickory.
" Andrew J. Hoover, Lincolnton.
" William D. Pemberton, Albemarle, Stanley county.
" Ogden D. King, Wilmington.
" Frank J. Garrett, Rockingham.
" James H. McDuffie, Keyser, Moore county.
" Starkie S. Daniel, Winton, Hertford "
" Andrew W. Goodwin, Raleigh.
" Robert L. Gibbon, Charlotte.
" Alanson Capehart, Roxabel, Bertie county.
" John M. Belk, Munroe.
" Alpheus Fields, Kinston.
" Buxton Boddie Williams, Warrenton.
" Whipple W. Clark, Hominy Creek.
" J. C. B. Justice, Leicester, Buncombe county.
" Robert W. Winborne, Barnitz, Chowan "
" John L. Ray, Burnsville, Yancey "
" John W. Neal, Meadows, Stokes "
" Charles B. McAnally, Madison, Rockingham county.
" James A. Austin, Long's Store, Union "
" Hiram C. Jones, Wilbar, Wilkes "
" Frank M. Winchester, Munroe.
" Amos F. Jones, Wilkesboro.
" Edward F. Strickland, Bethania, Forsyth county.
" David A. Stanton, Level Cross, Randolph "
" John E. Ashcraft, Munroe.
" J. P. Fearington, Bellevoir, Chatham county.
" James S. Doak, Ruffin, Rockingham "
" James C. Grady, Seven Springs, Wayne "
" J. Wellington Byers, Charlotte.
" Richard D. Hodge, Raleigh.
" Henry B. Shields, Carthage, Moore county.

A (duplicate) license was issued to Dr. M. F. Fox, of Guilford county, a licentiate of the Board at Durham in May, 1885, it having been represented that the original license was lost.

The business of the Board being completed, it adjourned *sine die.* W. J. H. Bellamy, M.D., Secretary.

REPORT OF CHAIRMAN OF SECTION ON OBSTETRICS AND GYNÆCOLOGY.

By E. M. Littlejohn, M.D., Thomasville, N. C.

(Read before the Medical Society of the State of North Carolina, at Charlotte, April 14, 1887.)

Mr. President and Gentlemen:—In offering to you my report as Chairman of the Section on Obstetrics and Gynæcology, I have borne in mind the fact that, when the reports of the chairmen of sections are so long, it allows too little time for discussion, reading of clinical histories, etc., pertaining to that section (as was called to our attention in a late issue of the North Carolina Medical Journal), I shall therefore be much more brief than has usually been the custom. Though, the subject of "Antiseptics in the Practice of Obstetrics" I consider of so much importance, that I will be more voluminous on this one subject.

OBSTETRICS.

The Application of Antiseptics in the Practice of Obstetrics.

This is a subject that we all know is not new, but as there seems to be some opposition to it of late, I have thought it proper to try to demonstrate *from facts* that the use of antiseptics in the practice of Obstetrics has done as much for the preservation of human life as Listerism and antiseptics have for surgery. In 1847 Semmelweis, then a clinical assistant in the Lying-in Hospital at Vienna, made the startling assertion that "puerperal patients were chiefly attacked with puerperal fever when they had been examined by the physicians who were fresh from contact with the poisons engendered by cadaveric decay; that fever ensued in the practice of those who, after p st-mortem examinations, washed their hands in the usual manner, whereas no fever, or but few cases of disease followed when the examiner had previously washed his hands in a solution of chloride of lime." This observation was the foundation-stone, as it were, of our present knowledge of the application of antiseptics in obstetrical practice.

Before making a comparison between results obtained years gone by, when no regard was paid to the use of antiseptics in this branch of the

profession, and results obtained at present, it would be well to state the views now accepted in relation to puerperal fever. According to the "Puerperal Fever Commission," appointed by the Berlin Society of Obstetrics and Gynæcology, this disease causes from ten to fifteen per cent. of the deaths occurring during the period of sexual activity, and has destroyed nearly as many lives as small-pox or cholera. There can be no question that the weight of evidence is in favor of those who claim that what was formerly known as puerperal fever is septicæmia, identical in origin, cause and results, with the surgical septicæmia formerly so dreaded in surgical wards of hospitals and in the private practice of surgeons.

It is, moreover, now clearly recognized that the great number of all puerperal inflammatory affections, such as cellulitis, metritis, peritonitis and the like, owe their origin to infection, and the attention of obstetricians has been drawn to what bacteriologists are doing in laboratories. It is to-day admitted by many obstetricians, and leading ones, that the infection in these cases must come from without.* Innumerable investigations have shown conclusively that the suppuration process, as well as many of the acute diseases termed infectious, are due to the activity of the lower forms of life known as bacteria. This is especially true of that class of affections which may be called "maladies following wounds." It may be considered proved by the experiments which have been made to determine, that in the healthy human organism there exist no bacteria. On the skin and mucous-membrane they are constantly present, but so long as the surfaces remain intact the most virulent organism known will do no harm; just as soon, however, as there is a solution of continuity and the bacterium is able to gain an entrance into the tissues of the body, then damage begins, provided the organism be possessed of pathogenic powers, in the first place. The first condition necessary for the hurtful activity of the bacterium to become manifest is that there shall be a solution of continuity—a wound of the skin or mucous-membrane. The second condition is that rather indefinite state of affairs called susceptibility, this being a lowering of the vitality, a depression of the blood-supply or some minute change in the cells, which it is beyond our power, as yet, to describe definitely. In the light of our present

* "The Use of Antiseptics in Obstetric Practice," by W. L. Richardson, M.D. *Boston Medical and Surgical Journal*, January 27, 1887.

bacteriological knowledge the terms pyæmia and septicæmia no longer retain their original signification. In the words of Koch, "pyæmia does not arise, as was one time believed, from the entrance of pus into the blood-vessels, and septicæmia is not putrefaction of the living blood." These appellations can now be employed only as collective terms for a number of symptoms, which, in all probability, belong to different diseases; that is to say, are produced by the activity of different bacteria. It is only by the observation of these bacteria that one can say, with scientific exactness, what special form of pyæmia or septicæmia may be under observation. That this is distinctly true is proved in one way by Koch's observation of the bacillus of the mouse-septicæmia, which is fatal to the house-mouse and has no effect upon the field-mouse or rabbit, of pyæmic septicæmia and erysipelas in rabbits; and in the other way by the investigations of Rosenbach, Passet and others, who have shown that several varieties of bacteria are acting in the production of the suppurative and inflammatory processes in man. To what has been said regarding septicæmia and pyæmia, *puerperal fever* forms no exception.

Notwithstanding Pasteur's work upon the subject, the best investigations show, without doubt, that puerperal fever must be considered to be a name given for the sake of convenience to a group of symptoms which represent the effects of an attack upon the system by one or more varieties of bacteria. This disease is eminently a traumatic wound disease. A woman passing through the puerperal state with no untoward symptoms, has never been found to have bacteria in the system, whilst those attacked by puerperal fever are invariably found to have bacteria in the tissues, blood-vessels or lymphatics of the affected parts. The two conditions necessary to the entrance and growth of bacteria are present in the parturient state in a pre-eminent degree. The uterus after parturition is, like any other wounded surface, exposed to the air passing over blood and organic debris, especially exposed to putrefaction and the entrance of bacteria, whilst the profound modification of its tissues, blood-vessels and mucous-membrane furnish the second favorable condition for their growth after obtaining entrance. The bacteria make their way in from outside. They are not born from anything in the uterine tissue—there is no spontaneous generation about it. The vagina contains bacteria in health like the mouth,

and, like the bacteria in the mouth, those in the vagina do no harm. Even in a diseased state the ordinary putrefaction bacteria do not change their character, and puerperal fever and peritonitis do not result from their presence. It is only by the entrance of the pathogenic bacteria—and sometimes of more than one variety of these—that a disturbance is produced. These pathogenic varieties are *brought* to the uterus. They are not there at first, and are brought by the air or some other less suspected method of conveyance. The varieties of bacteria which have thus far been especially connected with puerperal fever, are :

1st. Rather long cylindrical filaments, appearing especially in rapidly fatal septicæmias.

2d. Streptococci or micrococci, occurring in chains, common in the milder forms of septicæmia.

3d. Diplococci or micrococci, occurring in pairs, and especially where there is suppuration.

4th. Micrococci in irregular masses.

Any or all of these forms may be found in a single case, and there is no doubt that these will, finally, be resolved into a more distinct and numerous classification. Unquestionably the problem is, how to keep these bacteria out of the body. Without their entrance there will be no puerperal fever or septicæmia. To my mind the problem is being solved by the use of antiseptics in the practice of obstetrics, and the time may come when the general practitioner of medicine, availing himself of this great advance in the Section of Obstetrics, may almost erase puerperal fever or septicæmia from the list of dangerous diseases attacking women in child-bed. How are we to prove our assertions? Not by means of those gentlemen who from time to time rush into print with reports of 500 or 1,000 cases of labor without loss of one (for we all know how prone people are to mention success and say nothing), but by results received in well-conducted maternites or lying-in hospitals under rigid antiseptic precautions. Let us first investigate the maternite of the great obstetrical centre, Vienna. The records of this institution show that during February, March and April, 1823, out of 698 women confined, 133, or 19 per cent. died of puerperal fever; in 1842, out of 3,287 women confined, 548, or 16 per cent. died; in 1846, out of 4,010 women confined, 459 died, and in 1854, out of 4,393 women confined, 400 died. Now, compare these statistics with the results

obtained to-day in the same institution. Take the report of Ehrendorfer, assistant at the second Vienna clinic. He reports that in 1882 2,898 women were confined in his clinic with a mortality of one-half one per cent. Among these were thirty-five twin labors, sixteen face presentations, fifty-nine forceps operations, twenty-three versions, three embryotomies, two decapitations, one Cæsarian section, twelve craniotomies and seven placenta previa. Besides these complications 211 students had the privilege of the wards and were instructed in the touch and delivery. In 1884 there were 2,788 confinements with a total mortality of 33·100 per cent. The complications, as in 1882, were various, and the number of students receiving instruction was 324. Spiegelberg, of Breslau, lost only five patients with puerperal fever out of 901 confined. Prof. Lusk, in his book of the edition of 1885, reports that in Prof. Streng's division of the maternite in Prague during 1882 and 1883 no deaths occurred from septic causes in 1,100 confinements. Dr. Goodell, of Philadelphia, reports two deaths in 756 cases of confinement at the Preston Retreat. Dr. Garrigues has proved completely the efficacy of antiseptic treatment at the New York Maternite Hospital. From 1872 to 1882, inclusive, the number of confinements was 2,827, the deaths 116, a little over 4 per cent. In 1883 thirty died of 345 confined. At this time a reform took place which included the following antiseptic precautions: The wards were fumigated and the floors and furniture washed with a 1 to 1000 per cent. solution of hydrarg. bichloride. Every patient upon entering the lying-in ward, after the bath, had her abdomen, buttocks, genitals and thighs washed with a solution of the same (1 to 2000). During labor the vagina was irrigated with the latter solution. When labor was prolonged the irrigation was repeated every three hours. Great care was taken of the hands on the part of doctor and nurse. Glycerin and corrosive sublimate (1 to 1000) were used for lubricating fingers previous to making internal examinations. Antiseptic pad was applied to the head during egress, and to the vulva until after the placenta was expelled. Absorbent cotton, covered with netting soaked in bichloride solution, was applied to external genitals during child-bed period. This latter applied and removed with the same care as in dressing a wound after a capital operation. Irrigation first of the vagina and afterwards of the uterus, immediately after labor, in cases where the hand or instruments had been

passed into the uterine cavity. After these precautions had been taken, in the following 162 confinements, there were *no deaths*, and from October to July, inclusive, of 409 patients confined, though many operations were performed, five died, but only three of these were from septic causes, and Dr. Carrigues believes they were the result of neglect of certain prescribed details. In the Boston Lying-in Hospital, from January 1, 1873, to December 1, 1884, 2,661 women were confined, with a mortality of 3.04 per cent. from septic causes, and during these eleven years the hospital was closed three times for several months on account of the great prevalence of puerperal fever. In 1885 antiseptic methods somewhat similar to those used by Garrigues, were adopted in this hospital, since which time there have been no deaths from septic causes, although during this time 681 women have been confined. In the face of such facts, which, if time allowed, might be greatly multiplied, he is an unwise, if not unfaithful, obstetrician who does not surround the puerpera with every possible protection against the entrance of septic germs through the gateway opened by the necessary traumatisms of labor.

To the general practitioner of medicine the facilities for carrying out the minute application of antiseptics in the practice of obstetrics cannot be so great as in a well-conducted maternite or lying-in hospital, but every medical man engaged in obstetrical practice should make every effort to approximate these minutiæ. He should ever be careful in attending a patient in labor, after being in attendance upon a case of puerperal fever, scarlet fever, erysipelas, etc. And when in such attendance he should disinfect his own hands and see that nurses or those who come in contact with the patient's parts, do likewise. For this purpose iodoform grs. 5, or carbolic acid grs. 4, to ℥ i of vaseline can be used. The examining finger should be smeared with this ointment afresh upon each examination. The genitals and surrounding parts should be washed in a 1 to 3000 solution of bichloride of mercury. And if forceps are to be used, the vulva and vagina should be washed out with the same solution before application. All instruments used should be thoroughly disinfected by washing them in a carbolic solution ʒ ii to a pint of warm water. I prefer carbolic solution as a disinfectant for instruments, as the solution of bichloride corrodes them. After the child's birth no undue haste should be made to effect the expulsion

of the placenta. This should be accomplished by Credé's method of expulsion, care being taken not to introduce the hand within the vulva, vagina or uterus, if such can be avoided. The perineum should be carefully examined. If there is sufficient laceration to require suturing, the parts are washed with the solution of corrosive sublimate, and then the edges are brought together by means of carbolized catgut sutures, some powdered iodoform being subsequently applied over the seat of laceration. After this the vaginal injection is repeated and an antiseptic pad should be applied to the vulva; for this the ordinary napkin, smeared with iodoform ointment, answers a very good purpose in private practice. The bichloride solution can be made without *trouble* by using the antiseptic tablet manufactured by John Wyeth & Bro., of Philadelphia. The addition of one of these tablets to three pints of water, furnishes us with a solution of the required strength. The use of the antiseptic pad or napkin should be continued until the patient sits up or until all danger of septic infection has passed.

Whenever the mother has given birth to a putrid child or a partially decomposed placenta, an intra-uterine injection of the bichloride solution of the same strength is given at the close of labor, in addition to the vaginal one.

I believe that the acceptance of the benefits derived from the use of antiseptics in obstetrical practice and the application of the same by the general practitioner of medicine, would do much to decrease, if not efface entirely, that dreadful disease puerperal fever or puerperal septicæmia—a disease which in the past has destroyed as many lives as small-pox or cholera, but, as Dr. Lusk, of New York, has truly said: "Puerperal fever differs from either small-pox or cholera in that the latter presses largely upon the aged and very young, while the former (puerperal fever) gathers its victims exclusively from a selected class, viz: from women in adult life, the mothers of families, whose loss, as a rule, is a public, as well as a private, calamity."

Dr. John Bartlett read a paper before the Gynæcological Society of Chicago in which he proposes a substitute for Porro's operation, as follows: "The operation proceeds, as in Cæsarian section, till the child is removed, the actual cautery being used in opening into the womb. Then, instead of dragging the womb out through the

abdomen, it is dragged out through the vagina. The operator passes a Wells' clamp, somewhat modified in its prehensile surfaces and properly curved in coincidence with the parturient canal, to the fundus of the uterus, and then secures a firm grasp into the uterine tissues. By traction upon the forceps and pressure and suitable manipulation from above the fundus of the uterus is depressed into the body of the organ, dragged through the cervix into the vagina to produce complete inversion. The clamping wire is immediately adjusted and excision of the uterus and appendages effected at a suitable distance from the vaginal junction. The abdominal wound is closed, and attention is given to the stump with reference to hemorrhage, as in Porro's operation."*

Hofmeir, of Berlin, in reporting on the progress of obstetrics and gynæcology in Germany, says there has arisen a good deal of opposition in that country to Credé's method of managing the third stage of labor. But I think these gentlemen will have to bring forward vastly more evidence in opposition to this than they already have, before we can think of giving up this *very reliable* and well recognized procedure.†

Although the leading authorities are very explicit on the subject of the use of ergot in obstetrics, yet I am aware that many physicians still employ it, whenever the labor is tedious, in the first and second stages. I therefore think it is not out of place to mention it here, and will just quote a few words from Lusk on "Obstetrics": "The only imperative exhibition of ergot is presented by the occurrence of *post-partum* hæmorrhage resulting from uterine atony. The unyielding, tetanic uterine contractions which it produces act most beneficially by occluding the orifices of the bleeding vessels. Even under these circumstances it should, however, be withheld until the expulsion of the placenta, lest the uniform uterine contractions lead to its prolonged retention or interfere with manual efforts for its extraction."

GYNÆCOLOGY.

During the past year many steps have been taken in advancing this branch of medicine. Abdominal surgery has been brought to a point that makes us hesitate no longer when the morbid condition demands it. The antiseptic mode of operating, with the enforcement of the

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†American Journal of Obstetrics, October, 1886.

rigid rules in regard to cleanliness has been so thoroughly established that the surgeon would scarcely think of opening the abdominal cavity without having at his command all the latest improvements in this line. Hot water is now considered one of the most valuable agents in the line of antiseptics—it not only acts as such, but to a very great degree prevents shock.

Prof. Wylie, of New York, has reported in the *New York Medical Record* 125 cases of laparotomy in which he used hot water in cleansing out the abdominal cavity, etc., with the effect of very materially reducing the rate of mortality. And Prof. J. H. Scarff, of Baltimore, has done eight cases of laparotomy at the Maryland General Hospital during the year with two deaths. But the first death and the fifth case of the series was in a child of nine years of age, from which a 16-pound cysto-sarcoma was removed from the left appendages. A few hours preceding operation a severe hæmorrhage took place in the peritoneal cavity and the child died two hours afterwards from shock. While much has been done to reduce the death-rate in abdominal surgery, yet we cannot lose sight of the fact that, from an examination of all cases of laparotomy, we find such an overwhelming majority are for the removal of the tubes and ovaries. Can it be that the castrating of women has been carried to an excess, and not enough of attention is paid to the treatment of pelvic inflammations before resorting to this extreme expedient? This brings us to the consideration of the discussion that has taken place during the year upon the subject of pelvic inflammations. Emmett, of New York, read an able paper before the American Gynæcological Association on "Cellulitis versus Peritonitis." He cannot believe that it is proven that cellulitis is a thing of the past, and the large majority of so-called "pelvic abscesses" are fallopian tubes distended with pus, etc. Dr. Scarff, of Baltimore, who has given this matter much attention, thinks that "cellulitis is a rather uncommon disease when not associated with peritonitis, it is of short duration and rarely leaves a chronic abscess. He does not think it justifiable to remove the appendages except under the following circumstances: 1st. An undoubted diagnosis of pyo-salphynx, and only one tube should be removed if pus does not exist in both. 2d. The appendages should not be removed, in the absence of pus, until not less than four to six months of persevering treatment with the use of hot water douche daily.

Iodine locally and glycerite of alum tampons three times a week. If these do not succeed, then we are justified in taking away these offending members."

Intra-uterine medication is the balance of discussion to-day. Mundé, of New York, has recently published quite an extensive paper on the value of this method of treatment, and it has been heartily endorsed by many of the prominent men of the country. The universal opinion of to-day is that the cavity of the body of the uterus should not be invaded by the strong applications of the past, but the cervix demands them still.

The making of a new urethral orifice (Emmetts' Button-Hole Operation) for the relief of certain reflex bladder troubles, is destined to become an operation of great favor, as relief, in most cases, is said to be immediate and permanent. One case, operated on (and reported) by Dr. Scarff at the Maryland General Hospital, is worthy of mention :

Miss A., aged 24, unmarried, was admitted January 28th, with the following history : One year ago began to suffer from symptoms of cystitis, with most painful micturition. All ordinary means failed to give relief, and so annoying did the symptoms become, that the posterior wall of the bladder was laid open in order to explore the cavity. At this juncture her attending physician, Prof. Erich, died, and she was sent to this hospital. An examination under ether revealed nothing abnormal in the cavity of the bladder, but at the urethral orifice, and extending into the urethra one-fourth of an inch, were two deep fissures that were extremely painful and irritated by the salts of the urine. The opening made in the bladder had not been closed. Emmett's Button-Hole Operation was thought advisable, and it was immediately done. It consisted in cutting out a round piece from lower wall of urethra just above end of fissures. The mucous-membrane of the urethra was brought through the opening and stitched to vaginal mucous-membrane with catgut sutures, to prevent closing up of the opening. In three days the effects of the operation had passed away, and with it all symptoms of bladder trouble. The rent in the bladder has since been closed up, and the patient is now convalescing—urinating regularly through the false opening.

Alexander's operation for shortening the round ligament is rapidly

growing in favor. According to Dr. Polk, of New York, "It affords the most rational method of relieving procedentia."

Dr. Eugene C. Gehrung, of St. Louis, writing in the *American Journal of Obstetrics*, under the head of "A New System of Uterine Medication," describes two instruments which he has invented—one for the application of liquids ("Aspirating Applicator," as he calls it), and the other for the introduction of powders in the uterine cavity. Both instruments are constructed with double canula (one inside the other), so as to allow ready efflux, which has been the great fault with most instruments heretofore devised for this purpose. They promise to add greatly to the safety and effectiveness of intra-uterine medication.

Dr. Miller, of San Francisco, has invented a very unique "uterine repositor." It consists of a thimble (to fit on the end of the index-finger) into which is screwed a stem of any length according to the size of the uterus to be replaced. He says: "It has all the advantages of either the plain uterine sound or any of the jointed instruments thus far recommended for replacing the retro-deviations, and none of their defects. It simply artificially elongates the index-finger, and gives the finger the same power as though the uterus had been previously dilated by sponge or sea-tangle for the purpose of introducing the finger, and then effecting reposition as recommended by B. Shultze. My thimble sound brings the uterus on the tip of the operator's finger, which is at once power and fulcrum, hence strains no tissue or ligament. The uterus being on the tip of the finger, is completely under the operator's control. The force which one employs is keenly appreciated, hence no undue strain is likely to be exerted on adhesions which are too strong to be safely lacerated, or even stretched."*

While many advances have been made in gynæcology, and means adopted for the relief of suffering women, yet death has, too, been showing his power in calling from our midst in the last year some of our highest minds in this field of science. I refer particularly to Profs. Shroeder and Erich, who have been called from labor to rest, and who have left behind them names that will be ever dear to the suffering companion of man.

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SOME PRACTICAL REFLECTIONS ON FOREIGN BODIES IN THE EAR.

By Richard H. Lewis, M.D., Surgeon for Diseases of the Eye, Ear, Throat and Nose to the Hospital of St. John's Guild, and that of the Leonard Medical School, Raleigh, N. C.

(Read before the Medical Society of the State of North Carolina, at Charlotte, April 14, 1887.)

The idea has suggested itself to my mind that, perhaps, as a general thing, from pride in our Society and our desire to present something worthy of it, we are too apt to think that our papers should embody something original, or should reach the dignity of elaborate essays. As a result, many of our very best men are deterred, either by modesty or a want of time, from contributing, as they should, and under a different impression might, to the interest of our meetings. By throwing the light of their own observation and experience on the ideas and work of others, they could add no little, not only to the interest, but to the value, of our proceedings.

In accordance with these views, I desire to cast in my mite by making

SOME PRACTICAL REFLECTIONS ON FOREIGN BODIES IN THE EAR.

A full consideration of the subject, it will be noted, is not intended. Indeed, it would be contrary to the principles laid down in the beginning. What I wish to do, inasmuch as I have not invented any new and ingenious instrument for their removal, nor devised any new method of using those already in vogue, is to call attention to, and to particularly emphasize, certain things in connection with their surgical management. These things are: 1. The importance of being *certain* that there *is* a foreign body in the auditory meatus before any attempt, is made to remove it. 2. The advisability, in attempting its removal, of first exhausting the resources of the syringe and warm water before resorting to instruments. 3. The objections to the use of forceps, and 4. The dangers of doing too much.

It is a well-known fact that children are very much given to putting things into their ears, and some adults have the same weakness, though with the latter the presence of foreign bodies in the meatus is

nearly always the result of accident. In consequence every conceivable variety of object, from a pea to a jaw-tooth, has been discovered in the aural canal, though such common objects as peas, beads, buttons, cherry-stones, pebbles, etc., are most frequently found. But the physician should never accept the testimony of the child or its parents as to its presence. Nothing should satisfy him but a sight of it with his own eyes—not feeling it with a probe, for many have been deceived by striking the bony wall of the canal. This ocular demonstration, unless the body be situated very near the entrance, cannot be made without some means of illuminating the meatus, and, therefore, every practitioner should be provided with a nest of ear specula and the ordinary perforated concave mirror, attached to a head-band, so that the hands may be free if occasion for their use arise. I almost feel as if I ought to apologize to the Society for dwelling on this matter, but not a few attempts, based on the testimony of the child or its parents, or by better men on the testimony of the probe, have been made to remove foreign bodies which were never in the meatus at all. And there are some cases recorded in which the too eager pursuit of this otic will-o'-the-wisp, if I may be allowed the expression, has caused the death of the patient. Such a termination would be sad enough if the result of a well-directed effort to remove something which might be dangerous if allowed to remain, but when the consequence of a crazy chase after an *ignis-fatuus*, it is exceedingly deplorable, to say the least.

When it has been ascertained, beyond peradventure, that there is a foreign body in the canal, a judicious effort should be made to remove it. The first step *always*, with exceedingly rare exceptions, in this judicious effort, is the faithful and correct use of the syringe and warm water. I say *correct* use of the syringe, because the neglect of certain apparently trifling details will, in very many cases, make all the difference between success and failure. These details are, first, that the syringe should have a reasonable amount of power. The common glass syringe does not act well, but in the absence of a regular aural syringe, the Davidson will answer fairly. But no physician should be without the ordinary hard rubber aural syringe, which can be bought at any well equipped drug store for seventy-five cents. Secondly, the nozzle should be quite small, so as to concentrate the force of the jet as much as possible. In this respect the Davidson is defective. A small nozzle can be made by drawing out a glass tube in the flame of

a spirit lamp, smoothly sharpening a reed of small calibre, or, best of all, if it be at hand, by slipping one end of a piece of very small india-rubber tubing or flexible catheter over the large nozzle. One special advantage of the tubing is that, being soft and flexible, it can be pushed close up to the body without risk, and the full force of the jet in that way obtained. Thirdly, the meatus must be *straightened* by pulling the auricle firmly upwards, backwards and outwards, and holding it in that position, while, fourthly, the stream is directed forcibly against the wall of the canal quite close to the body. The upper wall is to be preferred, as a rule, but if that fails, it should be tried against the other walls in turn. Although the body may fill the meatus so that no water can pass beyond it, still the whirling motion of the latter will often loosen and dislodge it. In fact, in an immense majority of cases, especially when the body is in the outer or membranous portion of the meatus, as it is almost sure to be if it has not been tampered with, the syringe will prove effective. In order to give the syringe a fair trial, it must be remembered that it should be used with considerable force. The presence of the foreign body will prevent any damage to the tympanum.

This method failing, the following may be tried: Make a clean stick of the proper size and adapt one end, as nearly as possible, to the shape of the presenting portion of the foreign body. See that the body is thoroughly cleansed and *dried*, more especially if there be discharge. Dip the fitted end of the stick in melted glue, and, quickly applying the same, hold it firmly in position until the glue hardens. If, upon withdrawing the stick, the pea or bead, or whatever it may be, does not come with it, the only thing left is a resort to instruments. The instrument one would most naturally think of is the forceps, but the forceps, as a general thing, is objectionable, for the following reasons: The bodies commonly found in the aural canal are usually more or less spherical, and they are, besides, nearly always hard—so hard that the teeth of the forceps cannot easily engage their surface. They are, too, for the most part, of sufficient size to completely, or almost completely, fill the meatus. In consequence it is very difficult to find room for *both* blades of the instrument to pass between the body and the walls of the canal, so that when the forceps is closed, the teeth, instead of falling on the opposite ends of a diameter, impinge upon the convexity of the outer half. The substance being too hard for them to take hold, they slip off, and, as a consequence, the object is pushed

further in. "Hope springs eternal in the human breast," and we are very prone to think that the next time we will certainly succeed, and so, repeated efforts are made, until the body is pushed beyond the isthmus, and then its descent to the drum is very easy. Knowing from my own experience how very apt one is, in the rush of active practice, to forget anatomical details which are not daily brought to his notice, I shall take the liberty of calling attention, just here, to the fact that the external auditory meatus is narrower a little beyond midway than at either end. In its relation to our subject this is a very eloquent fact, for any one who keeps it in mind will be very careful in his manipulations not to urge the foreign body beyond that constriction.

The most efficient instrument is a vectis, or hook of some kind, the best, probably, being the fenestrated curette. An admirable instrument is the forceps devised by Guye, of Amsterdam. Being simply the obstetrical forceps in miniature, each blade is a fenestrated curette, and can be used separately as such, but it is better in many cases to introduce the second blade also, while the foreign body is held in place by the first, and, locking the two, to extract it. Gross' curette, which has a tooth at one end, is a simple and useful instrument. But fenestrated curettes, Guye's forceps, and such other special appliances for this purpose, do not usually constitute a part of the armamentarium of even the most advanced physicians, so that the matter practically narrows itself down, after all, to doing the best possible with the means at hand. A bent probe will often make a very effective hook, and every one has a probe. If mislaid, there are very few who cannot extemporize a hook of some kind, or a wire loop, which will answer to the fenestrated curette. The point to remember is that no means should be used which is liable to push the body any further in. And it should never be forgotten that no hard instrument ought ever to be introduced into the ear except under a full illumination, and the surgeon should never take a step unless he can *see* what he is doing.

In the fourth place, I wish to call attention to the fact that foreign bodies in the meatus are by no means such serious matters as is often thought. "Experience has taught," says Politzer, "that the consequences attributed to foreign bodies are, with few exceptions, due to the awkward attempts made at extraction by non-professional hands." He mentions the case of an old man from

whose ear he removed a slate-pencil which had lain quietly unnoticed in the meatus for fifty years, and he also cites a case in which a pea remained for two years without exciting pain or inflammation. Unless the foreign body excites unpleasant reflex symptoms, as it sometimes does, those symptoms varying from a cough to marked interference in the nervous functions, and the syringe fails to dislodge it, it is often better for one not prepared with the necessary apparatus to do the work properly, to omit any attempt and let it remain. Remembering the statement of Politzer, cited above, we should make it a point, as occasion arises, to educate the laity in this matter by impressing upon them the risk of any one's attempting this apparently simple and trifling little operation who does not know exactly what he is doing. But according to the statistics unfortunate consequences have, in a few instances, followed efforts at extraction made by members of the profession. It therefore behooves us to bear in mind the exceedingly important relations of the tympanum, and never to permit the fear of failure, or the desire to succeed in accomplishing an object, to cloud our judgment. Such a caution, I am sure, is not needed by my hearers; but the idea of failure, even in the smallest matter, is so galling to some temperaments, and the courage necessary to its candid admission is, oftentimes, so great, that it may not, after all, be superfluous.

INSANITY IN ITS EARLIER STAGES.

By J. D. Roberts, M. D., Superintendent Eastern N. C. Insane Asylum, Goldsboro, N. C.

[Read before the Medical Society of North Carolina, at Charlotte, April, 1887.]

In a former paper presented to the Society at its meeting in 1884, I tried to show the importance of the study of insanity, and I now propose to indicate briefly the means and modes to be brought to bear on its early diagnosis. This is largely a compilation from recent works on the subject and originality is not claimed at all.

In commencing the study of a subject or, in this case, a disease, the first question which presents itself is: What is it; its description or definition? I freely confess my inability to give a satisfactory definition of insanity, one that will include all cases and at the same time exclude those states of mind caused by brain lesions, poisons, etc., not strictly belonging to insanity. We say that insanity is a state of mind caused by brain lesions, yet coma, caused by some direct brain lesions, cannot properly be called insanity. We make a definition taking into consideration the state of the mind as shown by the actions; yet the wild, hilarious conduct of the insane I have seen reproduced by individuals under the influence of brain poisons, as alcohol or *Cannabis indica.* A few definitions are here quoted that a fair idea may be gained of the scope taken by psychologists, and the difficulties to be overcome. Most authorities try to give a definition that shall cover the subject in both its medical and legal aspects, wherein much of the difficulty lies; a medical insanity, that is, one recognized as insanity by psychologists or the medical profession might not be so considered by the courts, and thus the difficulty is increased. The law takes cognizance of the responsibility of the individual. Our profession recognizes the disease, and in all medico-legal cases let us give our opinion as to the disease, for of this we may speak with some assurance, but of the purely legal aspects we cannot speak with the same confidence, and our testimony will be an individual opinion.

Hammond, in his "Treatise on Insanity," considering mind as a manifestation of brain action, says "healthy brain action is sanity and unhealthy action is insanity,* and that there is no middle ground; that the line is sharply drawn between the two." I believe it more difficult to draw the line between the two, than it is to detect the exact point where we can say that physical health leaves off and disease commences. I believe, in the large majority of cases, the change is so imperceptible as to be out of our power to say when the disease enters.

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*"Treatise on Insanity in Its Medical Relations." By Wm. A. Hammond. Preface.

As to the definition, Hammond writes as follows: "My own idea of insanity is based entirely on the fact that as a healthy mind results from a healthy brain, so a diseased mind comes from a diseased brain. Insanity, therefore, strictly speaking, is only a symptom of cerebral disease, and I would define it as a manifestation of disease of the brain, characterized by a general or partial derangement of one or more faculties of the mind, and in which, while consciousness is not abolished, mental freedom is weakened, perverted or destroyed."*

Dr. T. K. Cruse, quoted by Hammond, gives a very short definition of insanity thus: "Insanity is a psychic manifestation of brain disease." To this Hammond would add the words, "*unaltered by loss of consciousness.*" Thus amended he admits its comprehensiveness and clearness, and it is to be preferred to his own as it is shorter.

Dr. E. C. Mann gives this as a fair medico-legal definition: "Insanity is a disease of the body affecting the mind by deranging the faculties and causing such suspension or impairment of the healthy *intellect, emotions,* or the will, as to render the individual irresponsible." Dr. Conolly says: "Insanity is an impairment of one or more faculties of the mind, accompanied with or inducing a defect in the comparing faculties."

A few definitions as given by the courts are here quoted. In 1723 Justice Tracy held that "It is not every kind of frantic humor, or something unaccountable in a man's actions, that points him out to be such a mad-man as is exempted from punishment; it must be a man that is totally deprived of his understanding and memory, and doth not know what he is doing, no more than an infant, than a brute or wild beast; such a one is never the object of punishment."

This is probably the origin of the famous knowledge test, (*i. e.*, of right and wrong) which has been variously modified from time to time—some holding that the word power—power to abstain from the wrong and do the right—should be considered the test of sanity and consequent responsibility. Parke modifies this right and wrong test thus in charging a jury: "There was but one question for their consideration, viz: whether at the time the prisoner inflicted the wounds which caused the death of his wife he was in a state of mind to be made responsible to the law for her murder. That would depend upon the question whether he at the time knew the nature and character of the deed he was committing, *and if so, whether he was doing wrong in so acting.*"†

One of the greatest difficulties in the study of insanity is to know how to go about it. To know what you want to learn of any given case and the best manner of learning it, much depends of course on the individuality, the tact of the physician; but what is here written

*Hammond Loc. Cit., page 265.
†See Buckham, Appendix.

it is hoped will be of material assistance in recognizing this disease. The length of an article of this character precludes the making of it full enough for the alienist or the expert. If I shall succeed in aiding the busy general practitioner in these troubles, by directing his attention to the early symptoms of the disease in such a manner as to enable him to recognize and cope with it in its incipiency, I shall have accomplished my object in writing.

The old philosophers, metaphysicians and theologians believed and taught two great forces—mind and matter—looking upon mind as an intangible entity, an immaterial something not to be interpreted as other phenomena, and not amenable to natural laws, and we even find now, in a day of advanced thought, relics of these ideas inherited from our fore-parents, and while not as fully believed in as formerly, yet in the study of insanity its influence is felt, and the subject is not investigated as fully as are other matters pertaining to the healing art.

Psychological science must be based on physiological study, and must be undertaken in connection with the study of the body. The mind must be considered as a function of the brain, and studied in connection with the brain as other nervous phenomena are. A healthy mind in a healthy body should too, ever be kept in view.

One of the first requisites for the intelligent investigation of insanity is that the inquirer divest himself of any remains of that relic of barbarism that madness is a possession of a devil or a curse from God. The old aphorism that whom the gods wished to destroy they first made mad, should not deter us from a scientific study of so important a subject, on account of a seeming sacrilege in interfering with God's laws. The laws ofnature have already been violated somewhere by some one, and disease is the result. Nature is an exacting mistress and demands an observance of her edicts, and metes out punishment for their violation. Whatever the derangement, it can be asserted that there is a defect somewhere: that there is an interruption of function from some cause; what this defect is and where the interruption is located, it is our province as physicians to study. There is a pathological cause, hidden it may be—and in insanity is, in the majority of cases—but it is there. Such is the scope of disease of the brain, that it would be impracticable to say here much of causation, and indeed it is not causes that I wish to bring to your attention but the mode of study.

Causes.—For convenience of description all insanities are here divided into three forms, viz: *mania*, *melancholia*, and *dementia*, This division is not intended as an arbitrary one, but nearly all forms can be treated as subdivisions of these three. It must not be expected to find every case assuming the characteristics of one of these forms, for but few cases run a full course without some of the characteristics of the first two and often of all three.

Mania is marked by an exalted condition of the mind, an exuberrance of spirits, wild hilarious conduct, rapid succession of ideas, very restless manner, etc. The features are generally well marked especially if the patient is possessed with some predominating idea or delusion. This, though, is not the case every time as there is a rapid change of physiognomy with every passing idea. The physical disturbances are generally prominent, and first I will mention sleeplessness. The patient goes for long periods with little or no sleep. This as a diagnostic sign is invaluable, for while the other symptoms may be simulated for a while, the strongest will cannot resist the demand for sleep. The bowels are nearly always constipated, the tongue is furred and there is generally cerebral congestion with headache.

Melancholia is a state of depression or despondency, and is shown in every act or position assumed. In its earlier stages the gloomy feeling may be thrown off for awhile but this is only temporary. In its characteristics it is the opposite of mania. The patient is prone to look on the dark side of everything, and finds material for grief in the most trivial circumstances. The whole aspect is one of depression and often of fear. A thorough examination of the physical condition of the patient is more liable to show some disease of the body as a cause of the insanity, than in mania. The skin and hair are always dry and harsh, and the bowels liable to constipation.

Dementia is a terminal stage of nearly all insanities that assume a chronic form instead of recovery. There is, though, a primary dementia, in which there is a vacant meaningless expression of countenance, which can probably be summed up in the word silly as generally used. This is distinguished from idiocy or imbecility in the fact that the latter is either congenital or arrested in development before maturity, while the former occurs after maturity. This should not be classed with the dementia of old age, which is a decay from physiological causes. Demenita may originate from severe shock to the nervous system or emotional centers, or from direct injury to the head.

These symptoms are the ones observed in the earlier stages of the disease. There is another class of cases to which I will call attention here, though hardly coming within the scope of a paper of this character, as they are chronic. They are alluded to because the symptoms are so little noticed, that the physician's attention is not directed to them until some serious overt act, some attrocious crime, is committed under circumstances of such a nature as to appall whole communities. 'Tis this class of patients that throw the lawyer and physician in opposition to each other in courts of law: the one contending that the act is from an evil nature and the other that it is the result of disease. If a complete history can be obtained, it will be found that, in the past, it may be a remote period, even many years, there was an insanity mild

perhaps, which seemingly recovered. The immediate friends may know that there was not final recovery, and that there was still existing, a chronic form of the disease. To most of persons the patient is in sound mental health, transacts business well, and seems to exercise good judgment. A little queer perhaps, but not enough to cause much remark. In these cases there is apt to be a fixed delusion, hidden to such an extent as to be known to only a few intimate friends, mild or harmless in its general character, but only needing a stimulus to bring it prominently forward. Such cases are often found in our asylums, and cause remark from visitors as to why they should be detained. For years these patients showing neither the excited condition of mania nor the depression of melancholia, finally to lose all control of self and commit some act against which they had probably striven for months. It is from this class of patients that we have many of the unexpected suicides. The form of the insanity assumed and character of the acts committed are too numerous to notice in this connection. These cases require special care in their examination as it is often difficult to determine as to whether there is wickedness or disease as the exciting cause.

Whatever the form assumed, or after progress of the disease, there are certain premonitory symptoms always observed in its incipiency. These are occasionally so slight as not to be complained of by the patient, and often not noticed by the friends and family. These symptoms always come before the intellectual trouble. There is an inability to sleep; the patient may assign some cause for the sleeplessness, as his financial affairs, the state of the atmosphere, or some slight bodily ailment. Another symptom of importance is a change in the emotional state, or the emotions are not under the same control as formerly; the family or friends notice that he is more irritable than usual or that he laughs or cries for trivial causes, and this is often recognized by the patient himself.

There is often pain in the head, some cerebral congestion, as shown by heat, throbbing, etc., and congested eyes. The intellectual disturbances follow these symptoms. False ideas arise, and the judgment being perverted to such an extent as to prevent their correction, delusions, illusions and hallucinations result. If the patient attempts to act on these false beliefs, the physician is consulted; often though, the advice is not sought at this stage, and the disease is let alone until well established, and the family can no longer manage the patient or bear with his actions. It is to be regretted that such is the popular opinion in regard to insanity, that both patient and friends do all in their power to hide it, or are loath to acknowledge its existence. Judging from the history of the treatment of insanity, this prejudice has less foothold now than formerly, and the general practitioner can do much

to combat the popular error, and foster the evidences of a better feeling on the subject.

Statistics of the curability of insanity vary from 20 to 80 per cent., but all observers are agreed that if treatment is begun in its very incipiency at least 50 per cent. of all cases are curable.

Insanity is held by some as but a symptom, strictly speaking a manifestation of a diseased organ, as shown by the words and actions of the individual, and it is the comparison of these words and actions of the individual, with those of a sane mind that enable us to pronounce it insanity. In investigating the subject as to the insanity of an individual, his conduct should be compared with the known character borne prior to the disease or the changes noted. These changes should be scrutinized carefully for adequate causes tending to produce them. Still another comparison is essential—are the words and actions such as should be produced by those assigned to a healthy individual?

"The diagnosis of almost all other diseases depend principally upon weighing the evidence afforded by physical signs and symptoms upon evidence addressed to the senses; but in mental disease it is, for the most part, dependent upon evidence which is cognizable by the intellect alone, and upon data which the senses furnish to us only at second hand. The physician is compelled to bring to this investigation not only a knowledge of those functions which are subservient to the vegetative and animal life of the individual, but also a clear analytical conception of those which collectively constitute mind. He must not only be a physician, but a metaphysician; not, indeed, in the almost opprobrious sense of this term, but in that better sense which designates the lover of truth seeking to ascertain not the essence of mind, or any other unattainable abstraction, but the laws of mind, which are as regular as any other natural laws, and to attain the knowledge of which offers a useful and legitimate object of philosophical research." (Bucknell & Tuke.)

If the case is one occurring in the physician's own practice, he is supposed to know something of the history, the peculiarties, eccentricities, etc., not only of the patient, but of the family. Should he not be informed on this subject, he should by no means begin his personal examination of the patient until inquiries are made. Much care and discretion are necessary in this part of the examination. The history of the former mode of life, changes in the mental state, causes for the changes, duration of symptoms, present state of mind, delusions, and the general health of the patient, down even to the minutest particulars, should be gathered. In questioning members of the immediate family on these points, let it be remembered that there is often a disposition to excuse the actions of the patient, and even to cloak or hide facts, arising from the antipathy existing in most minds to having

a member of the family pronounced insane. Especially will this disposition be noticed in the examination as to the family history. As complete a history of any family taint or predisposition to insanity as possible should be obtained.

Heredity holds a prominent place as a factor in the production of many diseases, and in none does it hold a higher place than in insanity, and in making examination on this point it is not enough to simply ask if there has been insanity in the family; something more is needed. The eccentricities, vagaries, etc., of the parent may and often do degenerate into a lower form of nervous disease, even to insanity, in the offspring. All diseases of the nervous centers, as epilepsy, chorea, paralysis, hysteria, hypochondria, and often tuberculosis and neuralgia, drunkenness and modes of life calculated to produce nervous depression, even though it does not every time amount to a disease in the parent, is liable to degenerate into insanity in the offspring. Such offspring are liable to inherit a lowered nervous vitality, which will not bear the strain of a healthy organization, and succumbs more easily when thrown into active competition in the race of life.

Stearns says: "It is not necessary that the tendency towards unstable mental action should be fully developed in the parent, in order that it may so appear in the child. Parents who have for years been very odd or singular in their habits of life or manner of speech and mental operations; those who are subject to periods of depression and are accustomed to look upon the dark side of daily experiences; mothers, more often, perhaps, who have all their lives been 'nervous' or irritable and easily excited, impress more or less profoundly these abnormal conditions upon their offspring. Great singularity of conduct habitually displayed, periods of depression, irritableness and nervousness, when crossed with similar characteristics in the other parent, or other unusual ones, not infrequently develop into actual insanity in succeeding generations."*

*"Insanity: Its Causes and Prevention." Stearns, p. 130.

When a suspected case of insanity presents a bad hereditary history, the suspicion is much strengthened.

That the state of the body has much to do with the causation of insanity, all will agree; and in its treatment the bodily state must not be neglected. Authors have tried to show a somatic origin for all cases of insanity, but this is fallacious. Still it is necessary to examine into the general health and correct all derangements, even of the most trifling nature, for each one may have some bearing on the brain trouble. I have seen insanity occur from ænemia, from innutrition, from dyspepsia, etc. And here is where the general practitioner has the advantage of the specialist, especially in our asylums. This condition is recognized early and can be appropriately treated at once.

When sent to an asylum, the patient cannot give to the physician a properly detailed history or account of his symptoms to insure intelligent treatment, even so simple a matter as constipated bowels having to be ascertained by a system of watching by the nurses.

It is well to consider in this connection, as to whether given symptoms are a cause of the insanity, or if they may not be a result of it. Take masturbation for instance—in many cases the insanity is the direct result of self-abuse, while in others the habit originates from a lowered nervous organization, accompanying the first stages of an insanity. In acute mania almost invariably and occasionally in other forms, the catamenial flow is suppressed. There is often a mistake made in these cases in attempting to remedy the suppression, under the belief that this is the cause of the mania. A return of the suppressed flow is a favorable indication, but recovery does not follow such return of menstruation in every case. Care should be exercised to determine which appeared first, the insanity or the suppression. Drunkenness may be, and often is, a cause of insanity, and yet the indulgence to excess in alcoholic liquors may be a symptom of a lowered nervous condition, the consequence of some depressing state, as sorrow, grief, loss, etc., for which relief is sought in dissipation.

The tact with which he approaches the patient will have much to do with the physician's success in obtaining data on which to base his diagnosis as well as future treatment. If the patient is suspicious, fearful of some injury, or that he is to be confined in an asylum, the task will be a hard one; but if he is loquacious it is but necessary to set him talking and simply throw in a word occasionally, adroitly directing the conversation in the channel of the insane thoughts if they have been previously ascertained.

The surroundings of the patient should be noted for evidences of erratic conduct or belief, especially if the patient is the head of the family or occupies such a position as to direct surroundings to any extent. Peculiarities of dress and manner will often throw light on the question, and may occasionally offer opportunity for an introductory remark towards engaging him in conversation. A study of the features should not be neglected, as they are often "mirrors of the mind" and indicate to a certainty the thoughts and feelings of the man. The manner, too, will greatly assist in directing your inquiries. Gain the confidence of your patient if possible. Let him know that you are his friend, and as a physician wish to do all in your power to alleviate his tufferings. If he will converse of his physical symptoms, let a thorough examination be made of all the organs, even though you are satisfied on these points. Time is gained and an opportunity given to strengthen his confidence, and intersperse your examination with conversation on other subjects. Conversation should be natural, un-

constrained, calm, and show sympathy wherever it will do good. Let the examination extend to all the senses—sight, hearing, etc.

Another matter that may throw light on the inquiries is an examination of any writings which he may have, as a patient will often show his insane thoughts in committing them to paper, when he would be more guarded in conversation. The contents of a patient's pockets will often reveal evidences of insanity, and direct inquiry as to opinions, beliefs, etc. Charms against witches, old pieces of tin, strings, buttons, pieces of paper representing money, things of no real value whatever, but to which much importance is attached by the patient, is often shown.

The method of reasoning shown by the patient should be tested. It is well to remember that often the physician will "meet a foeman worthy of his steel" in an argument with a patient undoubtedly insane. A rapid flow of ideas, much humor, and a faculty of ready *repartee*, being frequently combined in the first stages of the disease. He may reason well from his own stand-point, and advance arguments supporting his views of much strength, were the premises correct.

The existence of a delusion has been held as the test of an insanity, especially in medico-legal investigations, but this is not necessary. While the majority of the insane have a delusion at some period of the disease, it is not essential that one be detected in order to say that there is insanity. In the earlier stages, before the reasoning faculties are too far gone, it is sometimes possible to reason with the patient, and convince him that he is in error, but when well established this is a useless attempt. Steps should be taken during the examination to ascertain if there be a delusion, and its extent, *i. e.*, whether it is one calculated to lead to injury, or one harmless in character.

These are the salient points to be observed in an examination, and are thrown out as hints to guide the examiner. On each a chapter might almost be written without exhausting the subject. It is for the physician to use his own knowledge and tact in enlarging upon them. Every individual case will demand a special line and no routine rules can be given. The better the knowledge of human nature possessed by the physician, the surer he is of success in dealing with insanity.

A word as to treatment. The first question to be decided is in regard to where the treatment shall be conducted. If the disease is well established, and the patient is violent, homicidal, destructive to clothing, furniture, etc., or suicidal, decidedly the best place for treatment is in a well regulated asylum. This opinion is not influenced, I hope, by my connection with an institution for the insane, but from the necessities of the case. So few private individuals either have or can afford to supply the necessities for treating such cases at home, and again they rarely do well under home treatment. It is only exceptionally that a case can be treated at home. This matter must be

decided by the physician, and his opinion should be well weighed before pronouncing judgment.

Occasionally a mild case of insanity, in its earlier stages, can be treated at home, but even when it is decided that the patient is not to be sent to an asylum, it is best that he should be removed from home. Here he sees so much to remind him of his troubles, here his delusions are more liable to be fostered; a judicious but at the same time strictly enforced discipline is a means of treatment indispensable in diseases of the mind, and can rarely be obtained in the patient's family, especially if it should be one in authority and accustomed to managing affairs at home. The family can but seldom be induced to render the necessary co-operation, and unless this can be obtained it is almost useless to attempt the treatment. Of the cases that can be treated at home the physician must be the judge, taking into consideration all the points above noted. If the patient is to be sent to an asylum, the sooner it is done the better it is for him. A change of scene is beneficial in nearly all cases, and if mild enough, a visit to a health resort, under, of course, the care of some discreet person, is to be recommended. If the physician is so situated as to take the patient into his own house, it would certainly be desirable.

As to active treatment, the first object is to correct any physical derangement, and if there be a run-down condition of the system, as there often is, measures to build it up and put all the vital forces and organs of the body in good order must be taken. Rest and change of scene, change of work, new interests, calling for a different line of thought, requiring other talents to be brought into play, should not be neglected. By rest it is not meant that all work of every character should be abandoned, for if the patient is idle there is opportunity for the full development of the insane ideas in the mind. Rest from the harassing influences of whatever may be the cause, or whatever may be suggestive of the insane ideas, is indispensable. Manual labor as a factor in the restoration of a mind diseased is to be regarded as of primary importance. It is something more than out-door exercise, as in a simple walk, for it occupies the mind, drawing it off from morbid thoughts and feelings, and replacing better ones that tend to discipline and strengthen the brain power. Labor should not be pushed to extreme fatigue, but enough to produce a vigorous action of the blood vessels from exercise. Keep the various bodily functions in repair, produce a good appetite, and induce sound sleep. Good, nutritious food is indispensable, and the digestive organs should receive special attention. But little can be said here in the way of medicine directed specially to the insanity. More can be accomplished in the earlier stages of the disease by hygienic measures and what is generally termed moral treatment than by medicine.

SOME OF THE FACTORS OF MEDICAL PROGRESS.

By J. M. Hays, M. D., Oxford, N. C.

[Annual Oration. Read before the North Carolina Medical Society, April 14th, 1887.]

Mr. President, Ladies and Gentlemen:

To face the audience that greets my eye this evening were well calculated to make a Beau Brummell blush, a Demosthenes stammer or a Hercules faint. In wit, words and worth, action and utterance, and the power of speech to stir men's blood, I suddenly feel hopelessly deficient; and but for the fact that my speech will be short and the banquet table, which is next in order, long, I would have but little consolation to offer you.

I shall take the liberty of addressing my remarks principally to those of my audience who, like myself, have but recently entered the ranks of our profession, and who perhaps have been too busily engaged in keeping abreast with its constant, restless and ever-advancing tide of progress to devote much time to the consideration of the causes governing such progress or to make any attempt at a resolution of it into its elementary constituents.

Presumptious indeed would I be to attempt so gigantic an enterprise, requiring a thorough acquaintance with the history of evolution, sociology, and other intricate and mixed questions; but so fascinating is the field of thought presented by a philosophic inquiry into whys and wherefores of the development of medicine as a science, that I shall dare offer a few rambling and rather incoherent ideas that have occurred to me on this subject; not, let me say, with a view to instruct, but merely to suggest a rich line of thought to more fertile minds.

The present epoch in the history of medicine is indeed more brilliant and eventful than any which has preceded it, and the prospectus grows constantly more encouraging and richer in the possibilities and probabilities of glorious achievements. Year after year this learned, able, and representative body of working physicians meets, and year after year we recount with never-ceasing pride the victories won over suffering, disease, and death in our own fields of observation, and the advances made by the great and restless throng in the outside medical world, who with indefatigable zeal are ever pursuing and ever achieving; and the grand chorus to this cosmic anthem to the goddess of science which swells forth from every country under the sun, echoing and re-echoing throughout every land and from the isles of every sea, is Progress! Progress! Progress! Never yet has it been recorded that a retrogression had taken place, or that a backward tendency was evi-

dent in this onward march. The doctrine of evolution recognizes the fact that in the development of social as well as physical organisms, there is not an unbroken march of progress, for advancement alternates with decay, as day with night, or life with death; and yet in the growth of medicine there is and has ever been an increasing and unremitting tendency toward completeness or perfection—and this is what I mean by progress.

So much being granted, the query naturally presents itself, "Why should it be so?" We individually and collectively, I presume, repudiate the idea of chance playing any part in the affairs of men and things, and admit that every effect must be the outcome of adequate cause, whether ascertainable or not, for, as the Duke of Argyll has said, "Seeing the boundless extent of our ignorance of the natural laws which regulate so many of the phenomena around us, and still more of so many of the phenomena within us, nothing can be more reasonable than to conclude that somehow, if we only knew how, it is all right and according to the constitution of nature."

Social organisms, as I have already intimated, are as much under the reign of law as are physical organisms, both in their development and action; but are the laws governing the progress and development of medicine as irrefragable as those of gravity, chemical affinity or embryology? Austin Flint, that great patriarch and prophet of our clan, in his posthumous work, "Medicine of the Future," maintains that the progress of medicine is the order of Providence, and no sooner would I presume to deny this dictum than that the primary ætiological factor in pneumonia is the pneumococcus, and yet I dare say either assumption should be taken "*cum grano salis.*" At any rate such a comprehensive postulate does not satisfactorily answer the question under consideration.

I make bold the statement that each successive step forward in the history of our science may be directly, and to my mind satisfactorily traced to the agency of men, and to men who could do or not do at pleasure. I am not ignorant of the fact that I am on precarious ground, and far be it from me to invade the territory of Arminian and Calvinistic theologians; but what I do wish is firmly to impress each of our minds with the fact that progress in medicine is due to the individual efforts of men, and that if we are ambitious for ourselves, for the fair reputation of the profession of our State, or for medicine in general, we should not sit idly like Mr. Micawber, waiting for something to turn up, but rather shake off our wonted lethargy and turn up something ourselves.

And how often have we heard it said that our institutions are but the natural growth of time; that time is the great restorer of all things; that this, that or the other thing is dependent upon or caused by time.

Poetically speaking, this is perhaps all right, but in reality the causation of events is no more dependent upon time than the sun is dependent upon space for support, or fever upon the clinical thermometer for its reduction; and the physician who relies upon time to cure his patient is not a whit less unphilosophical than an old darkey who was under the care of one of my colleagues through a spell of fever. The clinical thermometer was of course called into requisition and with unusually gratifying results, for when it was removed from the slobbering buccal regions of the old descendant of Ham, he exultingly exclaimed, "Fo' de Lord, Mars Doctor, dat ting done hope me a'ready."

But to recur from Ham to Bacon: the latter says that time is the greatest innovator. Dr. Whately feels here called upon to apologize for the great unscientific philosopher of science, and conclusively shows that effects are produced in time but not by time, "for unless some cause is in action, no change takes place in the lapse of one thousand years." So that we are certainly safe in eliminating time as a factor in medical progress.

Nor do we owe aught to inspiration or revelation, save that which always sheds its hallowed light around the path of genius. Moses, Saul of Tarsus, Buddha and Mohammed were no more thoroughly imbued with the spirit of inspiration than were Harvey, the discoverer of the circulation of the blood; Schwann, the originator of cellular pathology; Pasteur, who first taught us about bacteria; Lister, who taught us how to kill them; or Tait, who has shown us that they are but insignificant affairs after all, and hardly worth the killing. One was the inspiration of revelation; the other of genius. The two are certainly independent, if not actually antagonistic, and only to the latter are our thanks due as scientists.

Whence, then, and how came this vast store of facts known to the profession, and who wove the beautiful fabric of our science?

As the spider weaves his own web, and the diminutive zoophyte gradually builds his own beautiful coral house, working day after day, and relying solely upon his own unaided efforts and architectural skill, so has our science been reared by the aggregated efforts of individual workers; and since the foundation stone was first laid by Hippocrates, every physician worthy of the name has contributed somewhat toward the completion of the noble pile.

Each generation has, for reasons that are obvious, occupied a vastly superior position to the one preceding it, and we of the latter part of the nineteenth century can scarcely realize how far superior are the advantages by which we are surrounded to those enjoyed by our grandfathers.

Sir James Paget has observed that the rate of progress in science in the last fifty years was twice as great as that in the previous fifty, and

that it should continually increase. Our knowledge, then, is not only being added to year by year, but being multiplied; we are advancing in geometrical progression.

There are but two sources of knowledge: experience and inference, and a constant recourse to them both is essential to the intelligent physician. In ancient times there arose and flourished for a while two distinct schools of medicine: the Empiric, which held that experience was not only the best but the only true teacher; and the Dogmatic, who taught that theory was of primary importance, and that what practical knowledge a man might pick up was just so much extra. Both schools were alike unscientific and unsuccessful in the accomplishment of the desired end. Aristotle, the druggist, the great philosopher and teacher, than whom few have exerted a greater influence upon humanity, has placed not only our profession but the world for all ages under a debt of gratitude to him for a combination of the two diametrically opposite and equally erroneous creeds into a happy medium of truth.

Notwithstanding the fact, however, that the solid and enduring foundation of progressive medicine was laid four hundred years before the Christian era, there was then "and has been throughout all ages," says Dr. Draper, "though continually repudiated by the profession, yet continually hovering about it, a host of impostors and quacks, as there will always be so long as there are weak-minded and shallow men to be deluded and vain and silly women to believe."

There are men, too, of great wisdom and learning who cannot apprehend a truth when thrust before their eyes, nor discriminate between the grossest errors of superstition and the plainest dictates of common sense. Witness John Wesley, one of the brightest literary and ecclesiastical lights of England's brightest age, the great leader of a great people, teaching his followers that physicians are but an expensive set of mercenary humbugs, absolutely devoid of every element of common sense and common honesty—prompted by the same spirit which made John Calvin, more than two hundred years earlier, roast Servetus "for two hours in the flames of a slow fire," while the martyr scientist, who almost discovered the circulation of the blood, "begged for the love of God that they would put on more wood or do something to end his torture;" the same spirit which anathematized the name of Copernicus, burned Bruno at the stake, and rendered miserable the days of Galileo for demonstrating the motion of the heavenly bodies and teaching the people that the Bible did not contain all that was knowable; the same spirit of inquisition which has always existed in the church, demanding that the scientist bring forth from his laboratory nothing conflicting with the narrow and dogmatic creeds promulgated by its theologians. Even now, with the glorious light of the nineteenth century penetrating her every musty recess, she sits like

the solemn owl, surprised and blinded by the breaking day, blinking at the light and life about her, absorbed in the recollections of the night that has passed, dreaming of new phantoms and illusions in its wished-for return, and vindictively striking her talons at any derisive assailant who incautiously approaches too near. And the Church, whose function it is to ameliorate the condition of humanity, has, by such a spirit prompted by bigotry and in past times by the basest of mercenary motives, done more to retard the growth of the physical sciences and scientific progress generally than any other, and I dare say all other hostile agencies combined. For hundred of years when the pontifical power at Rome ruled Europe and literature and art were in their glory, the investigator of the secrets of nature was compelled to conduct his work in the most clandestine manner or die a painful and ignominious death. Then it was that the people were taught that there could be no truth until it was so announced by a papal bull; then it was that ignorant monks and prating priests constituted the medical fraternity, the most learned of them treating their patients with less skill than does the old woman doctor of the backwoods of North Carolina at the present day. And had it not been for the fact that the Jews, Arabs and Moors in their far-off lands still nourished the spirit of scientific medicine, the rich legacy handed down to us from former ages had been lost to the world forever.

Some minds are like the human eye; the more light there is thrown upon them the more they contract. Wesley, in an age marked on every side by progress, would have torn down and utterly demolished the proud bulwarks of medical science, the work of centuries; and let us see what he offered us in return—"Go ask the infidel what boon he brings us, what charms for aching hearts he can reveal." He advises that opium, iron, bark, mercury and antimony be relegated to the category of unindexed oblivion. "For, says he, "they are far too strong." For cancer he would advise the use of poppy fomentations and rose water, and cites cases of thirteen and twenty years standing respectively, which he knew to have been cured by this regimen. Should this fail, however, use *stercus auserum* for its cleansing properties! For consumption an almost infallible remedy, even in its last stages, was to be found in bleeding to the extent of six ounces a day for a fortnight, and breathing in a newly-made hole in the ground. For deafness put salt in the ear; for blindness a drop of juice from a rotten apple or a little finely powdered *stercus humanum*. For prolapsus ani apply a cloth covered with brick-dust, because both are red. From all of which may the "angels and ministers of grace defend us." Surely the ancient doctrine of the pagan Greeks and Romans that every ill was but the manifestation of the wrath of some offended god and that in order to effect a cure sacrifices must be offered and the

gods appeased, were deserving of respect compared with Father Wesley's household remedies.

Let us not congratulate ourselves, my hearers, that the age of error and stultiloquence is numbered with the things that were, and that the Utopian days of medicine have come at last. See the thousands of testimonials issued daily from our religious and secular press, signed by clergymen, lawyers, school teachers and almost all other classes and conditions of men, but mainly clergymen, (and while I like preachers next best to doctors, I do think that as a class they are the most credulous and easily deceived people living,) all guaranteeing this, that and the other quack medicine to be a safe and infallible cure for diseases which have been pronounced incurable by scientific physicians since the morning stars first sang together, aiding and abetting the innumerable host of quacks in robbing the pockets and shattering the constitutions of a too gullible public.

A Roman priest, when taxed with some of the monstrous impostures of the clergy, replied: "*Populus vult decipi, et decipiatur*"—"The people wish to be deceived, and let them be deceived."

Or, again, where is the community which does not boast of its half dozen "old women doctors" with their never-failing "yearbs" and barks, and roots, and fetiches, and charms; and which of you, my colleagues, has not had your medicine laid on the shelf and some nauseating decoction poured down your helpless patient, and the excuse given that "Miss Betsy Ann she gin it to him caze her grammur took some and got well arter all the doctors done gin her out;" and if you remonstrate with Miss Betsy Ann she will spend a month in visiting her neighbors for the sole purpose of publishing you as "one of those stuck up doctors that don't bleve in nothing but strong medicines."

I regret that I have not the time to pay my compliments to that diabolical quintessence of quackery, the "faith cure;" but it is a subject deserving more attention than I can now devote to it, and I have already consumed enough of your time in recalling some of the obstacles medical progress has encountered and overcome, and in suggesting others that now confront us and will yet be suppressed, for it is a significant fact that in every instance yet where scientific advancement has been met and opposed by fogyism and the powers of darkness, a signal victory has been scored for the former. Science says to all its adversaries: "Get out of the way or I will run over you," and when this advice has not been heeded it has always been "so much the worse for the cow."

Great as are the results already accomplished by medical science, and exalted as is the position it occupies throughout the civilized world, it seems but reasonable to conjecture that it is still in its infancy. I could but be struck with the difference between the outlook of surgery, as portrayed by Erichsen, President of that Section, at the last meet-

ing of the British Medical Association, and that of medicine, suggested by our Flint, who was to have delivered the address before that distinguished body on medicine proper—both gentlemen occupying positions of distinguished pre-eminence in their chosen fields of practice. Erichsen said that the art of surgery, like sculpture, architecture and painting long since have done, has attained its highest degree of excellence; that every organ in the body has been invaded by the surgeon's knife; every artery tied; and every limb amputated at its highest point; in the future nothing can be done but to perfect the technique of the operations already practiced; while Flint expresses the belief that medicine was scarcely out of its swaddling clothes.

The explanation of this difference is readily found in the fact that surgery as an art is complete, because dependent merely upon anatomy and other well-nigh exact branches of knowledge; but as a science, like medicine, its progress is illimitable, being governed and held in check only by the advances made in biology, from which they are both the legitimate offspring. So long therefore as the subtle problems of growth, decay, life and death are wrapped in profound mystery, it is impossible that the subordinate science of medicine should attain anything like perfection. Nor does this fact invalidate the right of medicine in the least to rank among the learned professions. "If nothing is to be called science," says Huxley, "but that which is exactly true from beginning to end, I am afraid there is little science in the world outside of mathemathics. There are problems enough calling for solutions at our hands, however, and that can be worked out on the present ascertained biological data to occupy the profession for at least a generation; and no ambitious physician, pining to register his name forever in the book of fame, need become discouraged because it may seem that everything has been settled that is knowable, and nothing is left still in a state of chaos awaiting but the touch of his magic hand to restore the conditions of Heaven's first law.

> "All the means of action—
> The shapeless masses, the materials—
> Lie everywhere about us. What we need
> Is the celestial fire to change the flint
> Into transparent crystal, bright and clear.
> That fire is genius."

We cannot create laws nor discontinue their operation; all we can do is, first to understand, and then to guide them in their mutual action and reaction. There are certain fundamental and cardinal principles in the science of medicine which are acknowledge by all scientific men to be true and admitting of no dispute, a thorough mastery of which is the imperative duty of every one who assumes the grave and sacred responsibilities of the physician. And the more thoroughly we make ourselves acquainted with what is already known, the better prepared

will we be to enter with the proper spirit and understanding into the consideration of questions unsettled or branch out in new directions and open paths to unexplored fields. Let us aim high. If we shoot low we will certainly hit the mark, but with the sun as our target we may at least hit the moon, and with our courage screwed to the sticking place may even hit the sun itself.

Let us then determine, who have life before us, to do something during our career to elevate the standard of the profession, and not depend upon it to elevate us. We live in an age of invention, discovery and progress on every side, and if we are deficient in push, energy and old reliable Teutonic pluck, we will be pitilessly forsaken by the great onward tide which waits for no man, "and like eels in the mud be left to crawl. In numbers our ranks are already full, and there is certainly no room amongst us for drones and fogies. The element of Rip Van Winkleism is fast dying out, and I long to attend its funeral.

Fogyism is not confined to old age, nor is youth synonymous with progress. Youth has originated some of the greatest movements of the world and has most largely contributed to the agency by which they have been effected; but youth should not turn a deaf year nor a derisive smile on the grave counsels, wholesome restraints, sagacious suggestions and modifications issuing from the experience of age. The impulsive fire and earnest vigor of the one, and the calm, deliberate judgment of the other, have a neutralizing and mutually salutary effect. Youth is the steam, old age the brakes; both have their function to perform, and neither should underestimate the value of the part played by the other. Let there be a concert of action, and let us all strive to elevate the standard of truth higher and higher until it shall shed forth such an effulgence of light that superstition, ignorance and charlatanism shall be dispelled like the mist before the morning sun, and science reign sumpreme.

ANNUAL MESSAGE.

By Henry T. Bahnson, M.D., President.

Read before the Medical Society of the State of North Carolina, at Charlotte, April 14, 1887.

Gentlemen of the Medical Society of North Carolina:

To-day we celebrate the thirty-eighth anniversary of our organization, as we assemble to hold our Thirty-fourth Annual Meeting. Temporarily interrupted by the disturbing influences of war, our membership has steadily increased, until the meagre list of a dozen names, now contains a full five hundred. The Medical Society of North Carolina has outlived the full measure of years of a generation. In that time it has achieved an honorable distinction among similar organizations. Its influence for good has been experienced by every community throughout the extended area of our State, and its fame has reached far beyond our own borders. It has maintained the good-will and confidence of its friends, and effectually silenced the calumnies of its enemies. It has labored in behalf of the poor and the suffering, until every jail and almshouse has been benefited by the ameliorating influence and supervision of its Board of Health, while its license law has banished quackery from the State. Have we not, then, just cause to congratulate ourselves upon this happy occasion?

We meet to exchange greetings, and, throwing off for a day or two, our toilsome harness, give ourselves over to a *quasi* recreation, which imbues us with new courage and fresh aspirations to overcome the difficulties of our life's work.

This is a reunion, when friend grasps the hand of friend, who, separated by hundreds of miles, but for this annual convocation would scarcely meet this side the grave.

I said advisedly a *qaasi* recreation. Delightful as are the social features of these occasions, our annual meetings are more than friendly reunions. We come together to exchange ideas, to learn new and emphasize old lessons in the duties of our profession and the art of healing. Each of us is a teacher—all of us are willing students. Individual experiences are related, items of professional information offered, essays and clinical reports presented, and by discussion the chaff is separated from the wheat, which we carefully

gather to carry with us to our distant homes. We leave these meetings strengthened and refreshed—our minds stored with new and useful knowledge, our hearts stimulated to renewed exertion, our hopes quickened, our faith confirmed, our ambition excited to achieve greater successes in our noble calling.

Did time allow, it would be pleasant and profitable as well, to refer to the past of our Society, and, recounting its trials overcome, and its obstacles surmounted, we could learn much of counsel and encouragement from its history. Its roll contains the names of a host of earnest workers, many of whom, alas, have gone to their eternal rest, and many, alas, who, by their presence here to-day, show their unabated interest in the creation of their labors. For it may truly be said of our Society that it was the work of no one man; to single out those who more than others were instrumental in its organization and maintenance, would be a hopeless task. Each in his degree, and according to his ability zealously aided the same. The North Carolina Medical Society, as it exists to-day, is the culmination of unselfish individual effort, inspired and united by the affection borne for it by its members. If we sincerely desire to promote the cause, in the interests of which we are here assembled, we must emulate the example of our predecessors, in laying aside every selfish consideration, and with singleness of purpose combine earnest individual effort in our work as a Society. Let each one ask himself, what have I done, and what can I do, to deserve the honor of belonging to such a nobly built and grandly successful organization?

Look back upon the year that has passed. Has your conduct been always in accord with the spirit of the Code of Ethics, that grand bulwark and safeguard of professional relationship, which you recognize as part of the Constitution of this Society? Have you invariably, in thought, and word, and deed, conformed to the Golden Rule, of which the Code of Ethics is only an amplification, and regarded a brother physician's interests as you would have him regard yours under similar circumstances?

Again, what have you done to promote the interests of the Society since its last meeting? What lessons have you learned to impart to your fellow-members? What clinical observations have you elaborated to contribute to the general fund of knowledge? What time and thought and labor have you devoted to the cause of

medicine in general, and your Society in particular? Has your Society no claims upon you? Does any one of you think that his obligations to it are cancelled by the payment of his admission fee and annual dues; that this is a fair return for the benefits it confers upon him? If so, I pity him; bnt I pity our Society more. Of such material it could never have been formed; with such material it cannot long be maintained.

But, fellow-citizens, I am constrained to hope for better things from all who are here to-day. Your presence is a proof of your interest in the great and noble cause of which our Society is the exponent—the increase and dissemination of medical knowledge and for the alleviation of human suffering. Inspired by such an ambition, I bid you welcome, and pray that the blessings of an overruling Providence may attend our deliberations.

Our Society is responsible for the organization and maintenance of two important State institutions, viz: the Board of Medical Examiners and the Board of Health. Allow me briefly to refer to their work for the past year.

The Board of Medical Examiners remained in session for one week at New Bern, and during that time examined 62 applicants for license. Of these 46 were granted license and 16 were either rejected or allowed to withdraw their applications. For the faithful labors of the gentlemen composing this Board the people of North Carolina owe unstinted gratitude. We may well be proud of the grand work accomplished by this Board, and I am sure you will all agree with me in commending it for its faithful performance of a most necessary but unpleasent and thankless duty.

I wish it were possible to speak in a similar strain of congratulation of the operations of our Board of Health. In part I can truthfully do so, and take pleasure in tendering our thanks and heartfelt approval to the staff of this most important institution for their meritorious performance of the work which we have entrusted to them. A perusal of their biennial report shows that they only need our coöperation to insure a successful prosecution of their undertaking. They have accomplished a great deal, and they report a decided improvement in the workings of the county boards of health. But when we notice that hardly half of the counties in the State have a board or superintendent of health, and that not nearly

all of these submit a report, we must acknowledge that the State Board of Health falls short of what it should and could be.

The condition of many of our jails and poor houses is a disgrace to the communities in which they are situated, and justly merits the strictures contained in the report. Some months ago I visited a jail in one ef our most enterprising and prosperous cities. Grand hotels, spacious mercantile houses, commodious banks and costly residences indicated a wealthy community, while towering above the roofs of the loftiest buildings the steeples of numerous churches pointed towards heaven. To the casual observer there appeared a singularly happy blending of wealth and religion. In the shadow of the temple of justice was the jail building. Inside of an encircling brick wall pierced with two small windows, was an iron cage 12 feet square and 12 feet high. The cage was divided by an iron floor into two stories. Each of these was subdivided into two cells and a passage way. After my eyes had become accustomed to the dim light, I counted twenty-four human beings huddled in these confined quarters. They were clothed in rags, and a few tattered pieces of blankets and sacks constituted their bedding. Many of these poor wretches had lain there for many months, awaiting trial for petty offences. The place was reeking with filth, and the stench was beyond description. Every sanitary necessity was absent. The cage seemed literally full, but I was informed that twice as many were frequently confined in it; and, on account of its security, the jail was patronized by adjoining counties, in one of which is located the largest city of our State. Now, the county in which this jail is located has its board of commissioners, who appoints the jailor and are responsible for the health and safe-keeping of the prisoners. Grand juries, by order of the court, inspect and report upon the condition of the public buildings and their inmates—all the machinery of the law is in active operation—and yet, within the limits of an incorporated city, in sight of the hotels, the stores, the banks, the private residences, the houses of God, this foul abomination, this crime against God and man, existed and flourished.

I wish I could believe that the abuse I have feebly described stands alone in its horrible enormity. God grant our beloved State has no more such foul blots upon her escutcheon; and yet I fear this is not an isolated example. What if the law failed to correct this abuse; what if the pursuit of wealth engrossed the attention

of the average citizen; what if professors and ministers of religion neglected the injunction of their Master to visit the least of these His brethren in prison, can we, the self-constituted guardians of the health and lives of our fellow-men, excuse ourselves? If we are what we profess to be, laborers in the cause of humanity—if we are actuated by the philanthropic motives which should characterize the medical profession, how can we close our eyes or restrain our tongues at these outrageous enormities? As citizens we have a right, as physicians it is our duty, to correct these evils and prevent their occurrence. We have the power. Let us hold up the hands of our Board of Health; let us aid and strengthen and encourage our county superintendents, and let us show to the world that our philanthropic professions are not "as sounding brass and tinkling cymbals."

As I said before, we, as a Society, are responsible for the existence and maintenance of the Board of Health. Only by our coöperation, as individuals, can its ends and aims be accomplished, and its claims for efficiency as a State institution be justified.

The details of the terrible calamity which nearly destroyed the principal city of an adjoining State, must still be fresh in your memories. Being called upon by several prominent members of our Society to issue an appeal for the relief of our suffering confreres in Charleston, I first addressed a personal letter to Dr. F. Peyre Porcher, enclosing a contribution. His grateful reply, written in behalf of his more destitute associates, and detailing the urgent necessities of their unfortunate condition, determined me to issue the circular letter, with whose purport you all are acquainted. The result of this appeal was the collecting and forwarding to Dr. Porcher for distribution the net sum of $215.35. As I had originated the correspondence, our Treasurer, Dr. R. L. Payne, Jr., courteously turned over to me such sums as were sent to him, and I herewith present to the Society my report of receipts and disbursements:

RECEIPTS.

1886—September	23	To cash	(H. T. Bahnson)	$ 25 00
" "	27	"	H. E. Fries, Salem, N. C.	5 00
" "	28	"	Mrs. L. M. Fries, Salem, N. C.	5 00
" October	1	Dr.	Eugene Grissom, Raleigh	10 00
" "		"	P. L. Murphy, Morganton	10 00
" "		"	E. M. Summerell "	5 00
" "		"	W. P. Ivey, "	2 50

1886—October	1—Dr R. P. Bessent, "		1 00
" "	Capt. Jos. Walker, "		5 00
" "	Mr. F. M. Scroggs, "		2 50
" "	2—Dr. Thomas E. Anderson, Statesville		5 00
" "	4— " J. T. Shubrick, Winton		2 00
" "	" S. S. Daniel, "		1 00
" "	5— " R. H. Lewis, Raleigh		5 00
" "	6— " L. J. Picot, Littleton		2 00
" "	Mrs. Dr. Person, Franklinton		1 00
" "	Dr. Hunter McGuire, Richmond, Va		25 00
" "	8— " C. M. Poole, Salisbury		5 00
" "	9— " James L. Nicholson, Richlands		2 00
" "	14— " A. J. Battle, Earpsborough		10 00
" "	Collections at Neuse, Wake county, through Dr. T. B. Robertson		8 00
" "	Collections by Mrs. Dr. Person and Dr. L. J. Picot,		7 00
" "	16—Mrs. S. C. Robeson, widow of Dr. R. R. Robeson, Kyle's Landing		5 00
" "	18—Dr. Thomas F. Wood, Wilmington		10 00
" "	" W. E. Powell, Castoria		3 00
" "	" J. F. Harrell, Whiteville		5 00
"	Drs. R. L. Payne, Sr., and Jr., Lexington		3 00
" "	Collected by Dr. D. M. Prince, Laurinburg		30 35
" November	3—Dr. G. T. Sikes, Grissom		2 00
" "	4— " J. B. Gaither, Mill Bridge		3 00
" "	" E. Rose Dorsett, Salisbury		10 00
" "	" W. J. H. Bellamy, Wilmington		2 00
1887—January	4— " J. M. Boy Ette, Little River Academy		5 00
Total			$222 35

DISBURSEMENTS.

1886—September	23—By cash to Dr. Porcher		$ 25 00
" "	28—By postage stamps		5 00
" "	Printing circular		2 00
" October	2—Cash to Dr. Porcher		44 00
" "	7— " "		36 00
" "	9— " "		7 00
" "	14— " "		25 00
" "	19— " "		26 00
" "	23— " "		30 35
" November	3— " "		2 00
" "	15— " "		3 00
" "	" "		12 00
1887—January	5— " "		5 00
Total			$222 35

The contributions of Drs. E. Rose Dorsett and W. J. H. Bellamy did not pass through my hands. Dr. J. M. Boy Ette desired his donation to be devoted to the Charleston Medical College. Dr. Porcher's letter of acknowledgment and the accompanying receipt make further comment unnecessary:

"CHARLESTON, S. C., November 29, 1886.

"*Dr. H. T. Bahnson, President of the North Carolina Medical Society:*

"DEAR DOCTOR:—Having received through and from you and

others several contributions made by the members of your State Medical Society and others, as follows: Through Dr. Bahnson, President, $198.35; through Dr. Rose Dorsett, Salisbury, $10.00; Dr. W. J. H. Bellamy, through Dr. R. L. Payne, $2.00—($210.35)—I desire to make a special acknowledgment for the same, and thank yourself and the several contributors for their generous assistance. We know the difficulty which the medical profession, as a class, meets with in their efforts to support their own families, and we can therefore more readily and fully appreciate the self-denial exercised by many in your State in their generous and sympathetic efforts to relieve those of their brethren who have met with disaster here.

"I have made acknowledgments in the *News and Courier* of this city of all these contributions, and through whom they were received, in order that our citizens should be made acquainted, as far as possible, with the widespread sympathy which the misfortune from which they have suffered has excited among the physicians of North Carolina.

"We have to thank you and others (men and women) for the zeal and interest you have exhibited, and for the trouble you have taken in our behalf.

"I remain, with great respect and esteem, yours, sincerely,

"F. Peyre Porcher, M.D."

"Charleston, January 11, 1887.

"I received from Prof. F. P. Porcher five dollars, contribution from J. Middleton Boy Ette, M.D., for repair of Medical College of the State of South Carolina, forwarded by Dr. H. T. Bahnson, of Salem, N. C. J. Ford Prioleau, M.D., Dean."

Following the example of those who have previously held the office to which your kind partiality has elevated me, I have this opportunity to present some suggestions for your consideration.

The increase in our membership, as I before remarked, has been steady, and our list now embraces more than one-third of the reputable practitioners of medicine in the State. The increased attendance at our meetings is likewise very gratifying. But we desire to have all the physicians in North Carolina identified with our Society. That the interests of the profession as well as of the Society would be promoted by such a consummation, needs no argument. Every

medical man, whether in or out of the Society, must be convinced of the advantage of merging individual interests and influence into one common cause. Repeated efforts have been made to attain this end. Amongst other measures proposed is the one suggested by my immediate predecessor in the presidential chair, and which formed an important part of our original plan of organization, viz: the institution of county medical societies auxiliary to, and under the general supervision of, the parent Society. Now, that our numbers have so largely increased, and we have members in practically every county in the State, it is reasonable to expect more in this direction than was accomplished in the past. While I sincerely hope this measure may be most zealously prosecuted, and meet with abundant success, I confess that I am not content with the associate membership conferred by the county Society. What we want is a closer connection—a *bona fide* working membership. I believe that we make admission into our Society too difficult. As I understand the Constitution no physician can join unless he is present at the meeting, his application is approved by the Committee on Credentials, he signs the Constitution and pays the initiation fee of five dollars. Surely, with the restrictions afforded by our Board of Medical Examiners and our Committee on Credentials, we need not insist upon personal attendance. Many desirable associates, who would make excellent members, are, for one reason or another, prevented from coming to our meetings. If their application, endorsed by two members in good standing, could be received and acted upon by the Society, and a proxy be allowed to sign their names to the Constitution, I am convinced that all necessary safeguards would have been thrown about admissions, and we could secure the moral support of a largely increased membership.

As a means for increasing our membership, we have never utilized the opportunities afforded by these annual meetings. If we will, we can make them a grand school of medical instruction, which would attract all who have a desire to increase their professional knowledge and skill.

The best part of medicine is not yet written. Nothing is so valuable as carefully digested clinical reports. The humblest country physician meets with experiences, and is confronted by emergencies, hardly hinted at in the text books. In this practical age theories which have claimed the unhesitating faith of generations,

are controverted almost daily by the logic of facts. Let it be remembered that it was a country physician who led the van in the triumphal march of abdominal surgery. The country physician has one great advantage over his busy city confrere. In his lonely rides he has time to reflect upon his experiences. Some of the most interesting and instructive papers presented to this Society have been the result of the pains-taking studies of these very men.

It is not always, or even generally, the grave emergency or the unique experience, which is worth reporting. The simplest case of every day occurrence may convey a lesson which is of inestimable value. There is not one among you here to-day that does not carry in his remembrance clinical observations which would afford valuable instruction and assistance to his medical brethren. If every member present, stimulated by a sense of duty, would add his mite to the general fund the reproach that these meetings are lacking in interest would be effectually refuted.

The members of our Society are not wanting in education or skill in their profession. Contributions from their pens are sought after by the leading medical publications of the country, and yet very few papers are presented at the meetings, the range of subjects for discussion is limited, and only a small number take part in these discussions. This may be due largely to a lack of interest, or perhaps to a diffidence on the part of members, but I am of the opinion that this is not the main cause. The physician who feels that he has valuable information to impart, more especially if this information is the result of much labor and thought, naturally desires that the whole medical profession may have the benefit of such information, and hesitates to present it to so limited a number as are reached by the publications of the Society. He knows he is entitled to a larger audience, and who can blame him if he seeks it? I venture to say that, if all the articles written by members of this Society which have appeared in the various medical journals in the past twelve months were collected into our "Transactions" of this meeting, we would have a publication of which any medical society might justly be proud. Probably 550 copies of our "Transactions" are printed, and their circulation is confined practically to the membership of our Society. The necessity for a wider publicity, as an incentive to the preparation of papers for their annual meeting, was early recognized by our sister Society in Virginia, and, with all

deference to the talent and zeal of her members, I am confident that the publication of their "Transactions" in connection with a journal whose circulation and exchange list brought them to the notice of every reputable medical journal and prominent medical men in this country and not a few beyond the limits of the United States, was the lever by which they have elevated their Society into such meritorious prominence. In addition to the benefits accruing to the Virginia Medical Society, this action has helped to advance the *Virginia Medical Monthly* to the front of medical literature.

In adopting the NORTH CAROLINA MEDICAL JOURNAL, under its present management, as the organ of our Society, we could similarly benefit ourselves, and at the same time extend a helping hand to our worthy brother, whose absence from our meeting, both last year and this year, is due to the fact that he lies, stricken and helpless, upon a bed of sickness. For many years he has been our wise and prudent counsellor, our faithful and self-sacrificing, our voluntary servant—a standard-bearer of the medical profession in North Carolina. Actuated by purely patriotic and wholly unselfish motives, undeterred by apparently insurmountable obstacles, undismayed by the lack of encouragement and even the positive opposition of his friends, he has accomplished his self-appointed task, and we reap the benefit of his labors. His days for active professional work are cut short in his prime, but his heart is with us to-day, his brain and his pen still labor in our cause. He asks no recompense at our hands. His has been a labor of love, with no thought of reward but the approval of a good conscience and the accomplishment of a noble ambition. If we can induce our brother to take charge of our "Transactions" we would have the benefit of his acknowledged ability in censorship, the delays incident to our present plan of publication would be obviated, and we would enjoy all the advantages accruing from a largely increased circulation. Stimulated by the knowledge that our "Transactions" are not confined to our own narrow limits, but are subjected to the criticisms, friendly or otherwise, of the great medical world, we would naturally redouble our efforts, and, if this plan is adopted, I predict an era of intellectual activity in our Society such as we have long hoped for, but have hitherto failed to attain.

A speedy publication of the "Transactions" greatly enhances their value. It should be a rule of the Society that articles which

are not received within ten days after the close of the meeting shall not appear in the "Transactions." This is no hardship. Papers can be handed in during the session, and the best time to revise oral communications and impromptu remarks is while the subjects are fresh in the memory.

It seems a pity, inasmuch as we meet only once in twelve months, that our sessions should be so short. I strongly urge for your consideration the advisability of appointing an earlier day of the week for our meeting.

Our time, short as it is, could be more profitably utilized if a detailed programme were arranged in advance of the meeting. With little trouble the title and scope of papers to be presented could be obtained, and these, with the subjects for discussion and other items of information incorporated in a programme, a copy of which should be sent to each member with his notice of the meeting. I suggest that this matter be entrusted to the President and Secretary of the Society, in conjunction with the local committee of arrangements.

One of the most attractive features in the annual meetings of the Dental Association consists of the clinical lectures. One or more hours of each day are devoted to this purpose, and I am assured by personal observation, as well as by the testimony of friends in that profession, that numbers are induced to attend the meetings by the instruction thus afforded. I earnestly commend this idea to your consideration, and suggest that members be encouraged to present to this Society, at designated hours, such cases of interest as can be easily obtained in any community. The profit derived from these demonstrations would doubtless be greatly enhanced by securing the attendance at each of our meetings of one or more of the great clinical teachers of the country.

As your President, and on your behalf, I have taken the liberty to invite to this meeting several gentlemen from distant States, who have made themselves eminent in the profession. For such as have responded to this invitation, and by whose presence to day we feel ourselves honored, I bespeak for the Society a most hearty welcome.

In this connection I desire to emphasize the importance of maintaining, and, if possible, increasing our fraternal relations with the medical societies of adjoining, and even distant, States in the Union,

The friendly association with their delegates, their investigations of our plans and methods, and their participation in our discussions, cannot fail to stimulate us to renewed activity in our own domain, and enlarge our horizon, to the manifest enhancement of the interest and profit of these meetings. An appointment as a delegate to another medical society should be regarded, not as an empty compliment, but as an honor; and, if accepted, the duty of attending the meeting of such society should be considered obligatory.

As a man grows older his love for old customs and ways grows stronger. This must be my excuse for directing your attention to an innovation in the method of publishing and calling the list of members. Formerly the names were called at our meetings and published in the "Transactions" in the order in which the signatures were appended to the Constitution. The alphabetical list may perhaps be more convenient, although I am not ready to admit it. In any event, I hope the Society will instruct the Secretary to call the roll in the old way, and have the list of members published in the "Transactions" in the order in which they signed the Constitution, with the year of admission opposite the name, as a slight recognition of the claims of the veterans in our ranks.

By an oversight, which is to me inexplicable, we have in recent years failed to show the respect we certainly feel for the memory of deceased members. The last report of an obituary committee mentioned in our "Transactions" was made in 1881. Since that time no notice has been published of the death of members, many of whom, during their life, occupied prominent positions in the State and were active and valued members of the Society. The memory of such men as Marcellus Whitehead, C. Tate Murphy, Hugh Kelly, J. K. Hall and H. W. Faison will always be dear to this Society. In them were blended all the qualities that make the true physician and Christian gentleman. It is not my purpose to pronounce their eulogy, which deserves to be placed in abler hands. I ask the Society to authorize me to appoint an obituary committee, who shall at this meeting attempt to correct an unintentional omission of duty on our part, by rendering a fitting tribute to the memory of our departed brothers.

Fellow-members, you must be aware that the suggestions I have offered for your consideration are dictated by the love I bear for our Society, and in the hope that their adoption may aid in promoting its interests.

You have shown your appreciation of my devotion to our beloved Society by conferring upon me the highest honor it is in your power to bestow. I must crave a further favor at your hands: Bear with me in my inexperience, and lend me your assistance in performing the important duties which devolve upon your presiding officer.

ALIMENTATION IN CONTINUED FEVERS—THE SOCIETY PRIZE ESSAY.

By Dr. Francis Duffy, New Bern, N. C.

[Read before the Medical Society of the State of North Carolina, at Charlotte, April 14, 1887.]

The celebrated Dublin physician, Dr. Graves, more than half a century ago, was content that his epitaph should be: "He fed a fever." Before Dr. Graves' day starvation was classic management of fevers; food was considered as only fuel to the flames. Fever patients often had to stand (if stand they could) the ravages of disease plus depletion and deprivation of sustaining aliment. But clinical observers began to grow skeptical of the utility of this management, and when, at last, fever patients began to be fed, it was progress in the right direction, although the principles governing alimentation were but little understood, and the crude process of swallowing food not chosen or indicated, either by the instinctive guidance of desire or the theoretical knowledge of chemistry and physiology, was often as harmful as starvation itself. The day came, and perhaps in many places and with many men is yet, when substances of little or no food value were relied on to sustain life, when other substances, rich in food value were put in the stomach in greater quantities than could be harmlessly disposed of, and when substances in themselves harmful from indigestibility or other unsuitableness were allowed, or rather forced, upon the patient. Between these two extremes of starvation and suffering we may, as in most other cases, go safely in the middle way. That the natural, healthy human body can undergo periods of absolute starvation (water being allowed) varying from twenty to forty days, seems to be established beyond a doubt, and a very little nutriment, the body being in a state of rest, will sustain life through a much longer period. The clinical history of Typhoid Fever rarely embraces a period longer than a healthy man can starve. With these facts, let us further consider that there are other points somewhat in favor of abstinence in fever—let us consider what nutrition is; what the c ndi-tions are which are necessary to attain it; to what extent these conditions exist in continued fevers; and whether attempts at nutrition which result (as is often the case) in only the presence of undigested or unabsorbed alimentary substances in the alimentary canal is not

absolutely harmful. The process of nutrition requires, (1) Digestion—the conversion of foods into alimentary principles. (2) Absorption and distribution of these principles through the blood and lymph vessels. (3) Assimilation—the arrest or reception of these principles by the tissues and their conversion into the living elements of the body. Only the healthy body, with normal temperature, normal circulation, normal condition of the nervous system, with different kinds of nerves regulating or controlling all of the secretions and vital processes of the body, can perform these several functions to a degree requisite to the disposal of the daily allowance of food necessary for the maintenance of the body in health. The idea that increased destructive metamorphosis incident to the fever process calls for increased nutrition would, from a superficial view, seem to be theoretically correct, but practically we cannot accomplish it. The rapid molecular death of the tissues, under the influence of high temperature and the ensemble of chemical and vital phenomena which constitute the finer process, is incompatible with tissue-building to an almost prohibitory degree, and the digestive laboratory is crippled and incapacitated for performing its function. We cannot rebuild the new edifice while the old one is yet in flames. If, when gastric digestion is suspended albuminoid substances are artificially converted into peptones, absorption is not assured, and if accomplished, on the principle that any liquid would be absorbed by a thirsty soil, the third and crowning act of nutrition, viz: assimilation, can only be performed in a limited degree, and the blood, already burdened with the waste products of the body, which the emunctories are constantly removing, is further charged with the disposal of an excess of alimentary principles; retrograde metamorphosis goes on in the blood, and the amount of urea excreted represents not alone tissue waste, but waste of alimentary principles—peptones not converted into tissue.

Dr. Fothergill, while not writing dogmatically on a subject almost beyond demonstration, at least raises the question as to the possibility of a liver at a high temperature being able to perform metabolism, and to convert proteid matters into serum albumen necessary to tissue repair, and further the more probable retrograde metamorphosis and formation of kreatine—kreatinine, tyrosin and toxic products which poison the blood and add to the typhoid state. In connection with this subject of toxic products formed from alimentary substances, it may be well to refer to the curious alkaloids

known as ptomaines. These substances, producible from the cadaver in a state of decay, are sometimes found in the alimentary canal in life. The exact conditions necessary to their production are probably unknown except that it is a putrefactive change, but occasionally violent poisoning follows, the ingestion of foods apparently not unwholesome. (I believe the albuminoid substances are invariably present in such cases.) Chemical analysis of the foods not eaten fails to discover any poisonous substances, but in the alimentary canal a poisonous alkaloid is found, which chemists have claimed to isolate. Without asserting anything in this connection, is it not worthy of questioning as to the possibility of such conditions existing in the alimentary canals of fever patients as may produce poisonous substances by reaction upon foods which are under favorable conditions wholesome? In the *American Druggist* of September, 1885, is an article on the subject of ptomaines, giving an account of a report of Prof. Brieger to the Physiological Society of Berlin on the subject:

"Seeing that the ptomaines must here be regarded as the products of the pathogenic bacteria, Prof. Brieger set himself the task of studying the products of pathogenic bacteria."

Following this, after giving an intricate account of ptomaines which developed under natural putrefaction, it is stated that "It was the culture of the typhoid bacillus in meat in fusionand meat jelly which first led to the isolation of two new intensely poisonous bases, one of which being injected in small quantities into animals acted similarly to neurine, producing death under a strong flow of saliva, paralysis and diarrhœa, while the other produced only violent exhausting diarrhœa. In the *Druggist's Circular and Chemical Gazette*, May, 1886, it is stated that "M. Gautier, at a recent meeting of the Paris Academy of Medicine, presented an important communication on ptomaines and leucomaines." He then discussed the leucomaines or the physiological alkaloids formed in the tissues during life. The animal organism resists this constant auto-infection by means of two distinct processes—elimination of the poison and its destruction by oxygen." This natural oxidization and elimination must be complicated to a certain extent if the blood is charged with the additional and unnatural function of disposing of digested products which diseased tissues cannot assimilate. Having pointed out some of the theoretical dangers of over-alimentation, these

theories being based on anatomy, physiology and chemistry, let us turn to the practical or clinical aspects of the subject. The practitioner who administers to his patients having continued fevers a glassful of milk every two or three hours, also a quantity of beef tea, gruel or other liquid nourishment (of the sort considered most judicious in such cases) when there is no relish for it, and perhaps a positive repugnance, which could not be overcome except that thirst calls for liquids of some sort, will often encounter difficulties, some of which are as follows: nausea and vomiting, fermentation and formation of gases and other unwholesome products, increased tympanites and diarrhœa, the discharges in which often show undigested portion of the ingesta. Even the meat extracts can sometimes be recognized, and masses of casien separated from milk and varying in size from a pea or smaller to the size of a partridge egg are very common. When an excessive quantity of nutriment is swallowed the best thing that can be done with it is to discharge it from the stomach or bowels. If the practitioner is ambitious to stop this wholesome diarrhœa and has in his armamentarium anything which will accomplish his purpose, it will only be worse for his patient, for that which is digested and absorbed and which cannot be assimilated, will help to overcrowd the emunctories, increase the temperature and deepen the typhoid symptoms, and that which remains undigested in the alimentary canal, will cause the distress already referred to, and perhaps cause perforation of the ulcerated intestine, either by increased mechanical friction or by over-distension of the bowels by accumulated gases. I fear that the directions as to feeding which are given in some of our text-books are too literally carried out without necessary discrimination.

Dr. Loomis, after telling us of the degenerative changes in the salivary glands and in the glandular structure of the stomach and of the pancreas, and consequent loss of digestive function, says: "The quantity of milk is not limited, the patient may take all his stomach will digest—usually the patient will take from four to six quarts in twenty-four hours." Let us compare this with the quantity of food necessary for the daily wants of a healthy adult in active life. Dalton's Physiology, seventh edition (latest), page 130, sums up the different nutritive principles requisite as follows:

Albuminous matter	Grammes	130
Starch and sugar	"	300
Fat	"	100
Mineral salts	"	20
Water	"	2000

The imperial gallon, weighing 10 pounds, the standard gallon of the United States, weighing 8½ pounds, and the New York gallon, weighing 8 pounds, are liable to cause confusion when accuracy is desired. I will base my calculation on the New York gallon, as the book is from that State. The average specific gravity of milk being about 1030, there would be in one gallon of nutritive matter, approximately, as follows (there being in milk 43 parts of albumen to the thousand):

Albuminous matter	Grammes	150+
Sugar (nearly)	"	200
Fat	"	125+
Mineral salts (about)	"	14

This shows albuminous matter considerably in excess of the wants of the healthy adult at work. Also fat in excess, and that a substance which a fever patient loathes—sugar of milk deficient, also mineral salts deficient. The patient who can, as the text says, "take six quarts," will have an excess in addition to the above of 50 per cent. This seems to be feeding with reference to the waste of the tissues and with no reference to assimilation or what effect the surplus will produce. Will any patient swallow such a quantity of milk as an average of a quart every four hours, except as an act of compliance with the urgent solicitations of those who have him in charge?

The *Journal of Reconstructives*, April, 1886, quotes the experiments of Reichmann upon the length of time required by the healthy human stomach for the digestion of milk. About one-half a pint of raw milk was usually given at a time, and from time to time was removed from the stomach by the sound and pump. "The quantity mentioned (one-half pint) was found to be digested in three hours, and in four hours the last traces of the acid fluid had left the stomach." At this rate supposing that satiety was never reached and that the stomach kept constantly at work, two quarts

would be digested in twenty-four hours by the healthy human stomach. According to Dr. Loomis the stomach of the typhoid fever patient "takes usually from four to six quarts!" [Practical Medicine (a text-book of), by A. L. Loomis, second edition, p. 645.]

Dr. Flint says: "It is desirable for the patient to take as much nutritious food as will be digested and assimilated," and that sentiment, which cannot be gainsaid, seems to be about what all the writers mean, but authors and practitioners seem to have a different conception of what that quantity is; for instance, Dr. Flint says: "It is desirable for from one to two quarts per diem to be ingested."

Dr. Loomis, from whom I have quoted, writes of from four to six being usual. Within a few years a great change has occurred in the estimate placed upon beef tea and most meat extracts. Formerly (and often in these days) a quantity of fresh beef or other meat was thoroughly boiled in a little water, and this "tea" was in a great measure relied upon to sustain the patient. Now, it is generally known to contain none of the best elements of the meat and little of anything useful, and as it contains even excrementatious principles or products of retrograde metamorphosis, the grave question is raised as to how much harm is done by adding to the blood principles which in fever are already in excess. Some of these principles are said to be similar in their physiological effects to tea or coffee. Most commercial meat extracts are in the same category. Gelatin, a constituent of beef tea, has been proven to be of no value when taken alone, and even some experiments would tend to show it of no value, even in combination; but as it causes an increased production of urea, it is likely (in combination) of some food value.

Dr. Fothergill, while recognizing the importance of albuminoids, and especially the use of milk, which contains so many elements of nutrition, makes a strong plea for the use of carbo-hydrates in acute and prolonged fevers. He maintains the improbability of tissue genesis during an acute pyrexia* and consequent uselessness of over quantities of albuminoids, while the heat-producing elements are in great demand. Grape-sugar or glucose, in some of its forms, is the most easily assimilated, and should be freely supplied to prevent exhaustion. Dr. J. H. Bennett, from whom he quotes, maintains this doctrine, and supplements the heat-producing carbo-hydrates

*He refers to the observations of Drs. Ord and Broadbent, tending to establish these views. [Report to Medical Society of London, 1885.]

with alcoholics. Although standard authors advise the use of starchy foods to some extent, such as rice, baked flour, gruel, etc., it is a departure from the accustomed rule to subordinate the use of the albuminoid principles to the use of the carbo-hydrates. In the comparison already made between the different alimentary principles in a gallon of milk and the daily necessaries of the healthy adult, it has been shown that, although the albumen and fat were considerably in excess, the carbo-hydrate milk-sugar was deficient, and also, to some extent, the mineral salts. In the smaller quantity of milk, which is all most patients can use with advantage, the deficiency will be correspondingly greater. The writer has been himself the subject of a continued fever. The first day or two after the confinement to bed only water was taken; every form of nourishment was disgusting, and he cannot believe would have been useful. Then for a few more days only a few teaspoonfuls per diem of Valentine's Meat Juice were swallowed—sometimes with a little relish, sometimes with only a bare tolerance. Tea, with milk and sugar, rain-water, with ice and carbonated waters, were drank *ad libitum* to allay thirst throughout the disease. After the first few days a little milk was taken, also gruel, in small quantities. Butter-milk was far more palatable than unchurned milk, and was relished in considerable quantity and always agreed well in every respect. Clabber was used with the same relish and advantage. Chicken-water, with starchy substances, was occasionally used. Alcohol sparingly; toward the last Hoff's Extract of Malt;* and in no single instance was any one of these alimentary substances swallowed without at least a tolerance, and often with a little relish, especially as to the butter-milk and clabber, the slight acidity of which substances tends to make them agreeable to the thirsty fever patient. And theoretically they have advantages over unchurned milk, which in any considerable quantity furnished more fat than the fever patient can dispose of, and usually, there being considerable adipose tissue in the body, the want of this substance is not felt to the same extent as with the albuminoids and carbo-hydrates. The small amount of histogenesis which can be accomplished under such circumstances, will not be retarded for want of the fat necessary to the process. The lactic acid ($C_3H_6O_3$) which butter-milk and clabber

*An alcoholic pleasant beverage, containing nutritive carbo-hydrates,

contains is a carbo-hydrate, and from its acidity will render palatable the addition of other carbo-hydrates, such as extract of malt, honey (a mixture of glucose and saccharose and a little wax, etc.) or cane-sugar. In the attack of fever referred to neither appetite nor tolerance was ever wholly subordinated to mere theories of feeding. When food could not be taken without disgust it was not taken. When for many days at a time there was nothing which would do to call appetite, the articles already referred to were taken at intervals of a few hours in small quantities and always within the limits of an easy tolerance. Throughout the illness there was but little gastro-intestinal disturbance, but the loss in weight averaged nearly a pound per diem through a period of three weeks. No method of treatment of typhoid or other continued fevers of serious nature is of the undoubted value of judicious alimentation. The question of what we shall do, and how we shall do it, becomes a very grave one when we consider the theoretical and practical dangers of the subject. When we consider, on the one hand, the danger of starvation from too great an abstinence from food or too great a reliance on articles (such as ordinary beef tea) of little or no food value, and on the other hand of over-feeding or the giving of different alimentary principles in injudicious proportions, perhaps too much of one and not enough of another.

The prominence given by Dr. Fothergill to the use of the carbo-hydrates in continued fevers is unusually great, most authors giving greater prominence to the class of albuminoids. There will probably be some changes setting in the direction of Dr. Fothergill's views. In deference to his advocacy of grape sugar or glucose, as well as to the desires of fever patients, I have in a few cases used the juice (excluding everything else) of the ripe scuppernong grape, in which glucose exists in its natural state. In no case have I any cause to regret it. In a few cases I have used the juice of the Malaga grape, which is not half so rich in glucose. In one case, that of a vegetarian, who was accustomed to eating grapes, the Malaga grape juice was taken with relish and apparent advantage. This patient had been sick about three weeks when I first saw him. From his prejudices and peculiar mode of diet, eating only once in twenty-four hours, he was at a very low ebb, having an almost unaccountable hiccough. He had fever forty days and recovered—proving both the error of starvation and the possi-

bility of living under it with a fever during three weeks. My last fever patient, one now convalescent from an attack of continued remittent fever of three week's duration, was given Malaga grapes several times, but they did not seem to agree with his stomach very well. He voluntarily rejected them. There can be no arbitrary or invariable rules in regard to these matters. The individuality of the patient belongs to him, whether sick or well. It is not the fever which needs to be fed, but the patient; and this fever-stricken individual has his generic and his specific wants—generic in all that constitutes the selection of alimentary principles with reference to the physiological functions of persons in general—specific with reference to all that constitutes individuality, ranging in varying degree from the common type to the most peculiar idiosyncrasy. The patient's tolerance or intolerance as regards desire of what is offered him must be a strong indication as to what nourishment he should take. Food should certainly not be taken in any greater quantity than it can be digested and assimilated. If much milk is taken which has not been previously peptonized by some digestive agent, such as extract. pancreatis and sodii bicarb. or lacto-peptine swallowed with it, portions of it will usually pass through the bowels undigested and generally in the form of separated masses of casein. Neither will the starches be digested except in proportion as there are salivary, pancreatic and intestinal juices to convert them into glucose. Where soluble glucose and peptones ready formed are administered, the question arises as to what extent they can be beneficially disposed of in the economy. The experiments of physiologists have determined that glucose by dehydration is stored in the liver in the form of glycogen, and that this glycogen by hydration is from time to time reconverted into glucose, which is constantly fed out to the blood of the body in general, thus insuring a constant supply between the acts of feeding and digestion. In some cases of typhoid fever the liver is said to undergo but little structural change; in such cases it can most likely perform these functions, but in those cases in which it undergoes a degeneration of its glandular structure, it is not reasonable to suppose that its functions can be executed and theoretically the glucose would be better ingested in small quantities at shorter intervals. As to the peptones, the evidence is in favor of the assumption that histogenesis cannot go on, not at all commensurate with the waste during

an acute pyrexia, and that retrograde metamorphosis can occur to a harmful degree in the blood. In this connection the grave question arises as to the possibility of doing more harm by the administration of digested than of undigested alimentary principles, as the latter are more readily discharged from the alimentary canal than excess of the former from the blood. I think I can safely say that I have often seen benefit from the use of digestive agents or ready digested aliments in acute pyrexia, as in other conditions, although the danger of digested excess of milk peptones, beef peptonoids, etc., is a real one, and if the patient without power of digestion has a conservative loss of appetite, has not also the patient without power of assimilation a conservative loss of digestion? In view of the subjects and questions herein discussed, it is evidently not an easy task to feed the continued-fever individual patient with the best articles possible in the best possible proportions. Our greatest efforts will probably be only an approximation to this highest standard of excellence, and if we ignore alike the cravings and the disgust or the tolerance and the intolerance of the patient, and substitute the routine dietary of books, the opinions of authorities, or the apparent indications of science (although these are of great value), we shall make many mistakes. The inclination of the patient is a voice from within, an intelligence intimately connected with those processes in the tissues which determine their acceptance or rejection of nutriment. Degeneration of the glandular elements of the various digestive organs, rapid histolysis, increased waste products and defective elimination are voiced in that way. "It is a sound maxim in medicine that the therapeutic indications derived from science and from nature, as a rule, should harmonize," and when the scientific guidance of the physician and the instincts and desires of the patient go hand in hand, there can be but little difficulty in fulfilling the indications. There are instances where the fever process or poison so overwhelms the faculties of the patient as to deprive him of any choice in the matter, perhaps these cases would be fewer if alimentation was more judiciously performed from the first. Prof. Austin Flint (address to the New York Medical Association, 1884) quotes a German experimenter as having claimed to produce fatal toxæmia in dogs by the use of "beef tea," the excrementitious principles of which produced that effect. And innutrition itself tends to stupefaction, as also does the presence in

the blood of unassimilable peptones (unassimilable from antagonism of histolysis to histogenesis). It is in these cases where the physician is deprived of the guiding instincts of the patient that he will naturally experience the greatest difficulties in alimentation. He has then to consider what are the wants of the healthy, active human body—both as to quantity and quality of alimentary principles, and what are the powers of that body as to digestion and assimilation, and then to consider these matters with reference to the fever-stricken patient, and what modifications are necessary on account of his disease and his individuality. Then, being impressed with the fact that it is easy to give too much, give rather too much than too little; for we can by scrutiny detect some of the manifestations of redundancy, and it is, perhaps, if err we must, the safer side on which to err.

SOME PREVENTABLE CAUSES OF DISEASE AMONG FEMALES.

By R. L. Payne, M. D., Lexington, N. C.

Read before the Conjoint Session of the North Carolina Medical Society and the North Carolina Board of Health, April 14th, 1886.

Having been requested by the President of the Board of Health to prepare a paper for this conjoint session of the Society and Board, I consented to do so, not with any hope or expectation of presenting anything new to so intelligent a body, but with an ardent desire to awaken a renewed interest in, and more especially to impress upon all classes, the vast importance of an old and trite, but much neglected subject, to wit:

SOME PREVENTABLE CAUSES OF DISEASE AMONG FEMALES.

It is a fact well known to physicians, that very many of the ills to which females are liable arise from causes which can be prevented, provided parents, guardians, superintendents of schools, and all persons who have the oversight of young girls, exercise a reasonable degree of care, and have the firmness and moral courage to resist the foolish fashions of society, together with the judgment and common sense to realize the truth that girls and boys, though alike in some respects, are essentially different and require a different management. The skin is smoother, the bones smaller, the statue shorter, the voice softer, the heart-beat faster, the hips broader, the chest narrower in the female sex than in the male. Her nervous organization is finer and more sensitive than his, and to her alone is committed the development and maintenance of the physiological processes of ovulation, menstruation and gestation.

These and other physical differences, and others again of a mental and moral nature, should always be recognized in the rearing, training and education of females.

Prominent among the preventable causes of female diseases may be mentioned improprieties of dress, the want of suitable closet accommodation, the habit of half reclining upon the back with the feet elevated,

the long-continued use of the sewing machine, early marriages, the want of out-door exercise, and last, but not least of all, the defective system of female education.

The improprieties and deficiency of dress begins with the first clothing of the new born infant. It is true that this applies equally to infants of both sexes. They are very often dressed with the arms uncovered except by a narrow shoulder-strap, and the upper portion of the chest and neck left entirely bare, or only covered with some thin material, and thus the child is made liable to severe colds which retard its growth and implants the seeds of future disease, if perchance it does not die outright from the exposure.

But as the female child grows older this neglect of suitable clothing becomes more apparent. It is by no means an uncommon thing to see little girls of ten or twelve years of age wearing light corsets, high-heeled shoes, underskirts tied around the waist, in truth, rigged out in all respects as nearly alike the modern fashionable woman as possible. Such a one is very generally the pet and pride of her parents, who, thinking no evil, do not realize that by this manner of dressing they are increasing in a tenfold degree the possibilities of future disease and misery for their loved ones.

How can it be otherwise than most injurious when the normal functions of the lungs and diaphragm are interfered with and the abdominal and pelvic viscera are forced downward and displaced thereby? It is said that impressions of the ribs are often left upon the liver by the pressure of a tight corset.

My opinion is that this foolish mode of dressing a young girl cannot be begun early in life, and continued long, without inducing diseases which will be the bane of her whole future life, and which in many instances leads to a premature death.

Upon this part of my subject Dr. Thomas says: "The dress adopted by the women of our times may be very graceful and becoming, it may possess the great advantages of developing the beauties of the figure and concealing its defects, but it is certainly conducive to the development of uterine diseases, and proves not merely a predisposing but an exciting cause of them. The habit of contracting the body at the waist by tight clothing confines this part as if by splints; indeed, it accomplishes just what the surgeon does who bandages the chest for a fractured rib, with the intent of limiting thoracic and substituting abdominal respiration. As the diaphragm, thus fettered, contracts, all lateral expansion being prevented, it presses the intestines upon the movable uterus and forces this organ down upon the floor of the pelvis, or lays it across it.

"In addition to this force thus exerted, a number of pounds, say five to ten, are bound around the contracted waist and held up the hips

and abdominal walls, which are rendered protuberant by the compression alluded to. The uterus is exposed to this downward pressure for fourteen hours out of every twenty-four; at stated intervals being still further pressed upon by a distended stomach. * * * A great deal of exposure is likewise entailed upon women by the uncovered state of the lower extremities; the body is covered, but under the skirts sweeps a chilling blast, and from the wet earth arises a moist vapor, which come in contact with limbs encased in cotton cloth which is entirely inadequate for protection. It is not surprising that evil often results to a menstruating woman thus exposed."

How much worse must it be when the lower extremities are not covered at all, which is by no means unusual? Very many young girls in this country never wear any covering upon the lower extremities above the knees, except such as is afforded by the skirts, and the "chilling blasts" and "moist vapors" of which Dr. Thomas warns us exert their evil influences without even the let or hinderance of a pair of thin cotton drawers. Now this is dangerously wrong, and allow me to remark, *en passant*, that although I am by no means willing yet to see our "women wear the breeches," I am honestly of the opinion that her lower limbs should be protected by woolen garments as much like those we wear as it is possible to make them, and to this extent I acknowledge myself a believer in "woman's rights."

The narrow thin-soled and high-heeled shoe is the cause of many troubles which might be prevented. The thin sole exposes to damp feet and brings on severe colds and the protean ills which flow from them. The high heel throws the weight of the body upon the toes instead of the heels, causing ingrown toe nails, changes in the shape of the bones of the foot and ankle, and diseases and malformations about the joints of the toes, as corns, bunions, overlapping toes and other deformities.

But I believe the chief evil which arises from this cause is that the normal obliquity of the pelvis is so changed and the uterine axis so altered as very decidedly to increase the tendency to uterine troubles. It has been asserted, too, by good authorities that diseases of the spine and nervous system originate from the same cause.

Beyond a question, the want of suitable closet accommodations, or what is very common, no closet accommodation at all, is the direct cause of very many evils to the female. Rather than expose herself to the inclemency of the weather, as cold and wet, and other inconveniences attendant upon the evactuation of the bowels and bladder, she persistently resists these calls of nature, and manifold troubles result, as constipation of the bowels, hemorrhoids, pelvic congestions, uterine displacements, inflammations, etc., etc.

Of course this cause of disease can be readily prevented if comfortable arrangements are afforded and girls are made to understand that

prompt attention to the calls of nature are of most vital importance in truth, absolutely necessary in order to secure the highest state of health, both of body and mind.

The habit, so common among girls of this age, of half reclining or lounging upon easy chairs, upon the lower end of the back and sacrum, instead of sitting upright upon the tuberosities of the ischium, with the head erect and shoulders thrown backward, certainly conduces to uterine diseases, and the dangers arising from this cause are enhanced, when the feet at the same time are elevated upon a chair, or footstool, because when a female assumes such a position, the muscles of the abdomen are relaxed, the pelvis is thrown forward, and so tilted, that the weight of the whole abdominal viscera, together with the pressure from tight corsets, underskirts, etc., is directly downward in the pelvic cavity.

The highest authorities nearly all agree in condemning the immoderate use of the sewing machine as one of the most potent causes of pelvic troubles, and Dr. Goodell calls special attention to it, and says "While I do not believe all that is laid to its charge, yet its treadle motion does undoubtedly lead to pelvic, and portal congestions. In spite of myself, I have become convinced that no woman who operates on this machine, as a trade, can long escape from uterine derangement.

Even its family use is not unattended with risk, because, though intermittent, it is liable to be too prolonged." Now a little attention given to this cause, may be worth much in preventing ill consequences to females.

A very large number of American women marry when they are much too young. Many of them even before the bones of the pelvis are consolidated, that is, before perfect maturity, and this is another prolific source of disease, but whether this cause can ever be prevented, or not, is a question which I cannot determine.

However, it is but just to the gentle sex for them to know, that evil effects, in one form or another, are nearly always consequent upon too early marriages.

Naphey says, "It does not follow because a girl is capable of marriage that she is fit for it. Science teaches us many valid objections to too early unions. It goes farther, and fixes a certain age at which it is wisest for women to marry. This age is between twenty and twenty-five years.

Anatomists have learned that after puberty the bones of a woman's body undergo important modifications to fit her for child-bearing. This requires time, and before twenty the process is not completed. * * * * A too youthful wife finds marriage not a pleasure, but a pain. Her nervous system is prostrated by it. She is more liable to weakness and disease of the womb, and if of a consumptive family she

runs great risk of finding that fatal malady manifest itself after a year or two of wedded life. It is a very common for those who marry young to die young."

That the indoor life and sedentary habits of women, contributes in no small degree to the development of disease among them cannot be doubted. Charles D. Meigs used to say that "a woman ought to walk five miles every day," and most assuredly he was right, because nothing contributes more to the production of good blood and good digestion than active exercise in the open air and sunshine.

If a man is confined to a dark and ill ventilated dungeon he soon becomes pale and feeble. If a potato vine grows in a close, dark cellar, it is at most only a puny thing. In this particular a girl does not differ either from a man, or the potato vine, if she is not given a sufficiency of exercise in the open air and sunshine, she develops into a frail and delicate woman, diseased already as far as poor blood, poor digestion, flabby muscles and a disordered nervous system can make her so, and becomes thereby an easier prey to all the graver diseases "which flesh is heir to."

While very much has been done to elevate woman intellectually, and to ennoble her morally by education, much has also been done by the defective system pursued in her education, to render her an invalid, and thereby to disqualify her for the noblest purposes for which she was created.

Notwithstanding the clamor for her rights, and for her higher education, I confidently believe that her grandest, highest and noblest destiny on earth is most perfectly fulfilled when she becomes in the fullest sense of the words a good wife, a good mother, and a good friend. And I believe that any defect of moral, mental or physical training which unfits her for these sacred offices is a crime against God and humanity, and is a shame to this enlightened age!

Now the great defect of our plan of female education consists chiefly in the fact that these differences of which I have spoken are not recognized, or if recognized, are not considered of any moment, and our girls are forced, and crammed, and hurried through their school-days just as the boys are, and no provision is made for those organic changes which are going on, nor for that monthly rest and freedom from care which they absolutely require in order to a proper development of their reproductive natures.

Allow me, now, to quote the opinions of some of our highest authorities upon this much neglected subject. Dr. Clarke says: "The principal organs of elimination, common to both sexes, are the bowels, kidneys, lungs and skin. A neglect of their functions is punished in each alike. To woman is entrusted the exclusive management of another process of elimination, viz: the catamenial function. *

* * * A careless management of this function, at any period

of life during its existence, is apt to be followed by consequences that may be serious; but a neglect of it during the epoch of development not only produces great evil at the time of the neglect, but leaves a large legacy of evil to the future.

"The system is then peculiarly susceptible, and any disturbance of the delicate mechanism we are considering, induced during the catamenial weeks of that critical age by constrained positions, muscular effort, brain work, and all forms of mental and physical excitement, germinate a host of ills. * * * * The host of ills thus induced are known to physicians and to the sufferers as amenorrhœa, menorrhagia, dysmenorrhœa, hysteria, anemia, chorea, and the like. * * * Fortunate is the girls' school or college that does not furnish abundant examples of these sad cases. * * * *

"It is not asserted here that improper methods of study and disregard of the reproductive apparatus and its functions, during the educational life of girls, are the *sole* causes of female diseases. * * * But it is asserted that the number of these graduates who have been permanently disabled to a greater or less degree, or fatally injured by these causes, is such as to excite the gravest alarm, and to demand the serious attention of the community."

Anstie says: "For be it remembered, the epoch of sexual development is one in which an enormous addition is being made to the expenditure of vital energy. * * * * When we add to this the abnormal strain that is being put on the brain, in many cases, by a forcing plan of mental education, we shall perceive a source not merely of exhaustive expenditure of nervous power, but a secondary irritation of nervous centres like the medulla oblongata."

Dr. S. Weir Mitchell says: "Worst of all to my mind, most destructive in every way, is the American view of female education. The time taken for the more serious instruction of girls extends to the age of eighteen years, and rarely over this. During these years they are undergoing such organic development as renders them remarkably sensitive. * * * * To-day the American woman is, to speak plainly, physically unfit for her duties as woman, and is, perhaps, of all civilized females, the least qualified to undertake those weightier tasks which tax so heavily the nervous system of man. She is not fairly up to what nature asks from her as a wife and mother."

Dr. Thomas, in his work on "Diseases of Woman," uses the following strong language: "This pernicious system of training is observed most markedly in our large female seminaries or boarding schools, where every hour of the day is allotted by rule to its special work. By this plan the mind is constantly kept in the thraldrom of control, and chafes under the depressing influence of a never-ending surveillance. A set of romping school-girls could as profitably laugh by rule as really enjoy and improve by exercise under the eye of an instructress

or professor of calisthenics. It is not the mere bodily exercise which is of benefit, but the total mental relaxation, the exhiliration, and the abandon which accompany it."

Dr. Goodell declares that "Precocious cleverness is attainable only at the cost of physical and sexual development. The brain-cramming of our boarding schools and public schools; their buckram proprieties, and the autocratic Bismarckism of their government, breed a host of sickly girls who swarm in every class of society.

"Manifold diseases—functional and structural—date from the recitation room. They are mostly of a uterine complexion, for at this time of life the sexual sphere dominates, and the brunt of the nervous and vascular disturbance falls on the most exacting organs—the reproductive."

Thus I might go on citing the opinions of those best qualified to know, but these are sufficient to impress upon us the terrible ill consequences which flow from this cause.

Of course no one will deny that woman is capable of the highest of education, but it is held that she cannot in many instances attain this high standard without impairing, to a greater or less extent, those peculiar attributes and characteristics which of right belong to every true woman, and without which she is not desirable as a "helpmeet" for man, because of all the women on earth, the woman who is wedded eternally to books, or other literay pursuits, makes the poorest wife and the most negligent mother, while on the contrary, the woman of fair education, sound mind, fine health, and a good and generous heart, will fill these responsible and sacred positions in every particular.

I will not deny that there are exceptions, but still the rule is, that whenever a woman enters the arena of public life she very generally unsexes herself and becomes a sort of neuter gender, a laughing-stock for men and an object of pity for all true-hearted women!

Certainly she should be educated, and well educated too. Give her a good English education, and more, if she can acquire it without injury, but leave off those abstruse studies which vex and perplex the mind, and allow her longer time in acqniring an education; because she requires good digestion, good blood, good muscles, a healthy nervous system, and a normal menstrual function as much, or more, than education to fit her for a good wife and mother. She can have both good health and sufficient education, provided time and opportunities are given her for physical growth as well as for mental culture

I think that from four to six hours of study a day are enough for any girl. Let the remainder of the day be spent in household duties, in romping, and playing, and other exercises in the open air and sunshine, with entire freedom from all brain worry and care, if possible

By all means let her rest as much and sleep as long as she chooses during the catamenial week. Let public examinations be dispensed

with in our schools. give no medals, offer no rewards except for goodness, and our girls will grow up into fairer, better and healthier women.

But every plan of education is most defective which does not promote, not only the mental and physical development of woman, but also the moral and religious.

Her innate impulses are better than those of man. She is by nature a religious being, and must have some object of worship, therefore let her have every opportunity in this particular.

Teach her to cultivate virtue, modesty, fortitude and religion.

Teach her to be generous, warm-hearted and compassionate.

Impress upon her the beautiful language of Prof. Goodell. Says he: "Woman shines best, and thrives best, not in the adulation of society, not in obtrusive self-assertion, but in the quiet and faithful performance of her home duties. The heat and stir of life is food for man's more rugged nature. The wholesomest passages of her life are those which, like thesis of a symphony, are unpercussed and unaccented."

Then let her be qualified in all respects to be the presiding genius of some happy home, because home is the stage upon which she was made to act, the innermost shrine before which she should bow, the very temple of her heart's love, in which her many virtues shine forth in all their truest, noblest, most resplendent beauty, and if here she fulfills the duties of wife, mother, neighbor and friend faithfully, she performs her highest work on earth and merits the plaudit, "Well done, good and faithful servant."

> "Who does the best his circumstance allows,
> Does well, acts nobly—angels could do no more."

Now what I have attempted to do is most imperfectly done, I know, but I hope enough has been done to call attention afresh to so important a subject—important not only to us as individuals, but vastly so to the "unborn millions" yet to be!

It is true that base-ball playing, boating, the exercises of the gymnasium, the training of military schools, and the various other means for the development of the physical man, are matters of great significance; but let us not forget that they are all as nothing when compared with the benefits which a boy derives from a vigorous, healthy mother!

HEPATIC STIMULANTS AND CHOLAGOGUES.

The Annual Essay, by Geo. Gillett Thomas, M. D., of Wilmington, N. C.

Mr. President and Gentlemen:

Before offering you the results of my work to comply with the demand which your choice has laid upon me, let me thank you for your kindness in bestowing the compliment, and while I claim but little originality in the thoughts with which I shall occupy your time for a short space, let me beg your attention to a review of some of the authorities upon the drugs which have been classed as Hepatic Stimulants. The position of the liver in the body, its size, and its peculiarly important role in the general action to the physical economy, have made it always an interesting subject of study of the physiologist seeking to set out in full its normal action and relations, and to the pathologist and physician, when searching into the mysteries of its diseased state. In all the ages of medicine it has been burdened with the blame of more or less of the ills that have marked the course of disease, and opinions as to its functions have changed back and forth with the growth of knowledge and the progress of experiment. Galen, says Murchison, taught that it was the center of animal heat, the point of the manufacture of the blood, the starting point of venous system, and "was, in fact, the central organ of vegetative life." Such was the opinion, more or less changed, for all the years down to Harvey, who partly gave credence to it. That is the source of the bile and that it is engaged in blood-making, and, through its glycogenic action, is a source of heat, are now its recognized properties.

But the experiment of late years give to the organ a duty which is equally as important as these. For it appears, that after the reception of the blood through the portal system, charged with the absorbed products of stomachal and intestinal digestion, it becomes a purifier; for it seems to separate and eliminate such elements of the newly enriched blood as are possessed of properties in their prime state dangerous to life. Of course the material with which the portal blood is loaded consists of peptones; but their composition is not yet of such a character as to fit them for the purposes of nutrition or to immediately allow of their entrance into the general circulation. Ludwig and Schmidt-Mulheim found that the injection of peptones directly into the circulation were followed by dangerous symptoms, and were indeed

poisonous. And it seemed to these experimenters that the actions of these bodies resembled in general the poisonous effects of curare. Brunton suggests that along with the peptones, possibly as a part of them, there may enter as the dangerous portion, those peculiar bodies, ptomaines, generally the prodoct of retrograde action and decay, and possessed of such chemical properties as class them with the alkaloids; for when a solution of peptones is treated with ether and potash it yields a body which seems to be a volatile alkaloid, and if putrid peptones is treated in the same way a solid alkaloid, not volatile, is obtained. That these bodies exist in the body in health as well as disease appears from the researches of Burchard. He found them in normal fæces, as well as in the dejection of patients suffering with diarrhœa and typhoid fever. The same author has found these bodies also in the urine in health as well as in disease—and in proof partly of the presence of some such substance, the paralyzing action on frogs of human urine, resembling that of curare as shown by Bocci, with a train of symptoms exactly following the use of ptomaines from putrid matter, may be quoted. But whether these alkaloidal substances or the inherent properties of peptones as yet unexplained are the efficient causes of the action of the peptones before submitting to changes in the liver, the facts seems to stand that this organ has the power of clearing up the blood of a dangerous constituent, or constituents, and preventing its or their entrance into the circulation general. Foster says he uses the phrase "peptones" because there is reason to think that more than one kind of peptone exist, bodies of such affinity and yet such definite individualism as to make their diverse character evident, and upon this complex constitution may in a measure depend the peculiar properties we have mentioned. But before the discovery of the poisonous bodies indicated, it had been known, through the accurate work of Schiff, Lauterbach and Ludwig, that the liver had the power to deprive the portal blood of a component dangerous to life. Their statement to this effect, according to Brunton, was based on the observation that if the portal vein in an animal was ligatured, death ensued, and that the approach to death and the completed act was marked by the same symptoms that would appear if the animal had been bled to a fatal amount. Ludwig's explanation of this result was that the blood had been dammed up in the veins and prevented from entering the general circulation, and that it was operative as if the animal had been bled to death in his own veins. To dispose of this explanation, and if possible establish another and more tenable one, Schiff and Lauterbach injected into a frog a portion of the blood obtained from a portal vein which had been ligatured, with a fatal result to the frog. But the use of blood from a portal vein not tied did not cause death, and apparently produced no effect. The contradiction seemingly apparent here is dis-

posed of by Foster, in his declaration that the passage of the digested material into the portal radicles is slowly accomplished, and a sufficient quantity of the noxious substance, according to the experiment just alluded to, is not present in the open and moving circulation to affect the life of an animal other than its possessor. But it appears to accumulate, and a period of time greater or less to gather the power of destroying life, when the blood for the injection is taken from a subject in which the portal vein has been tied, and where sufficient time, (in the experience of Ludwig about three hours,) has elapsed for this accumulation to take place. Following the same general idea, and in proof *pro tanto* therefore of what we have thus far set forth, Murchison, in the introductory remarks to his lectures on functional disturbances of the liver, claims it as a settled fact that this organ not only makes blood, but is likewise a blood destroyer, and *in this process it may be*, but certainly in fact it is a blood purifier. Contributing largely to that transformation of albuminous material, reaching it both from the food and tissues, into urea and lithic acid, and beginning thereby the work of elimination of effete matter, which is finally completed by the kidneys, the liver must certainly perform the work of purification. The destruction of fibrin, which takes place in the passage of the blood through the liver, amounts, according to Brown-Sequard, to 86½ ounces daily. Add to this the apparently well-founded assertion that red-blood corpuscles are measurably destroyed by the action of the hepatic function, and white corpuscles increased at the same time, and that out of the blood, most probably from the hemaglobin which is left in the disintegration, is formed the coloring matter of the bile.

Of the glycogenic functions of the liver it is hardly necessary to speak, save to remind you that the performance of this branch of the labor of the organ contributes to the maintenance of animal heat by the supply of an oxidisable material, readily convertible into carbonic acid and water in the lungs; that it assists in cell-growth, as glycogen is always present when cell-growth is in active progress; that it probably is one at least of the sources of fat by transformation, and that some of the certainty of muscular action is dependent upon the sugar made by the liver.

To sum up the work of this great organ, we may say that it receives the blood through the portal system, enriched by the material of intestinal absorption, and burdened with certain waste matter that it has to care for; that it sifts out from this supply all the substances which would be dangerous to life or health, be these substances part of the peptones or such noxious bodies as ptomaines or the products of retrograde change as leucin or tyrosin, which are to become urea and uric acid, that it prepares the rest of material which is brought to it for the great work of nutrition, by restoring it purified to the general

circulation, that it makes and sends out the glycogen for its manifold uses in the economy, and that it secretes and excretes bile. In view of this complexity of functions, and of the paramount importance of its continuous action, such drugs as may influence the organ and restore its equilibrium, when it is disturbed, seem worthy of a short notice.

"The notion of a drug which should have a special action on the bile is as old as Hippocrates," says Legg, and after the days of Galen they were called cholagogues. To that portion of the materia medica which includes hepatic stimulants therefore, and cholagogues, we ask your attention. The latter class partakes in most cases of the character of the former and are generally necessary to their completed effect. In a general way it is sufficient to define a hepatic stimulant as a medicine possessed of the power to increase the action of the liver, and in practice this will be still further limited to such articles as will increase the secretion and excretion of bile. For it may be safely declared a rule, that in disorders of the liver, this part of the work will de disturbed, and that the return to a healthy condition from a morbid one will not be expected until there is evidence of a normal secretion and excretion of bile, as the result of medicines exhibited to influence favorably the diseased conditions.

To draw the line between hepatic stimulants and cholagogues we shall say that the latter are substances which if administered to the patient will remove the bile which it finds in the intestines, preventing its absorption and diminishing the quantity in the circulation, the result being, we shall presume, to remove along with the bile such morbid matter as it meets, while the former, the hepatic stimulant, has increased the functional activity of the liver, enabling it to free itself from such morbid material as has existed, and from which it could not free itself unassisted, while at the same time it gives expression to its influence for good by the increased secretion of the bile. As we said before, these drugs cannot be accurately classed always under either head, their properties blending and having the twofold effect, the result being measured often by dosages and other influences, and in using the expressions of the authors from whom we shall quote, the two terms are interchangeably used, cholagogue often indeed including in general the idea of a hepatic stimulant.

In this list we shall follow the classification of Brunton, and we turn first to *nitro-hydrochloric acid.* The power of this drug to act as a stimulant to the biliary function has long been admitted, and Rutherford has given it a place among the stronger ones. Later on we shall allude to the methods for determining the relative strengths adopted by experimenters. The mode of action of this acid is somewhat obscure. None of the experimenters have attempted an explanation of certainty, though by common consent Harley, Ringer, Bruton and Stille

mention it. Legg only gives it place as one of Rutherford's determination. Murchison says its power as a stimulant is doubtful. He claims that its action is due rather to an improvement of the gastric digestion than to any specific influence upon the liver. This statement leads us back to the theory that the liver is largely concerned in the relief of the system of any such substances whose presence in the digested matter passing through it as would impair the standard health or affect life, and if the digestion in the stomach can be aided or restored by any agent, the labor of the liver is by this change relieved of an increased burden and can perform its normal functions with normal energy. However, this reference of the influence of the acid to the stomach will not explain the results that, it is claimed, have followed its use for disorders of the liver by means of baths, or the application of it to the region of the liver externally. Horatio C. Wood gives undoubting credence to its power to affect favorably the liver, and says its action when administered internally is sometimes so marked that it is followed by bilious diarrhœa. His confidence in the benefits following its use externally to influence the liver is equally firm. Foster admits that the presence of an acid in the duodenum in the region of the orifice of the biliary duct causes a gush of bile to flow, but he says that *probably* this is a reflex action on the muscular walls of the gall-bladder and the ducts, causing a contraction of these with a dilatation or relaxation of the sphincter of the orifice of the common duct. His conclusion is that the effect of the acid therefore is to cause a discharge of bile and not an increased secretion. The experience of the profession which justifies the use of the acid as a hepatic stimulant will hardly bear out this conclusion.

Next to mercury, the influence of *aloes* on the liver has been more closely studied than probably any other of the articles used for purposes of increasing the secretion of bile. Its power seems to be most marked in small doses—a fact that may find an explanation in the tonic properties of the drug. It is slow in its action, and in its passage through the intestines stimulates them to secretions of intestinal fluid. Measurably these facts may account for its stimulating effect, as in its transit it may be stopped and absorbed in part, to return again with the bile which it has increased in the liver, and together with this secretion exhibiting its full force. This, however, is only a probable action. Stille says of its effects, quoting Widekind, that it primarily augments the biliary secretion, and that its secondary effect, or the consequence of the former, is to purge. Widekind describes its action in doses of four to eight grains as being attended by no distress except occasional eructation, and a warmth and uneasiness in the region of the liver before the commencement of its purgative effect. The evacuations, sometimes attended with griping, consist of several feculent stools of natural constitution, and if several follow one an-

other very closely they exhibit a bilious character, and have more or less mucus in them. The use of the drug by enema and its retention for seven or eight hours, produced a result similar to the one following its exhibition by the mouth, an apparent warrant to the conclusion that its action was due to the increased secretion of bile, which was discharged with it, as the drug could not remain for so long a time in the rectum or lower bowel unabsorbed and if absorbed it must have passed back through the liver and out into the intestines before affecting the result which appeared. The same author's commendation of its use in simple atonic jaundice, when no obstruction to the passage of the bile had occurred, is borne out by the authorities. Widekind claims that its exhibition in such cases is followed by good effects, when saline and other purgatives have failed, and that its cathartic action was not manifested until it returned to the stools their natural color. Ringer and Brunton quote Rutherford as authority for its prominence as a hepatic stimulant, and Rohrig declares that when it was introduced directly into the duodenum of a fasting dog, aloes greatly increased all the constituents of bile, although it purged but slightly.

Podophyllin has been so lauded as as agent for increasing the secretion of bile, that it has even now a place of esteem in many quarters above the mercurials. Its power being admitted, it was eagerly seized upon from this recorded clinical experience in its use, and from the desire to substitute for the mercurials a drug of equal power and divested of the dangers which the followers of John Hughes Bennett's Edinburgh Committee claimed were attached to their administration. But Bennett did not give his sanction to podophyllin, and it was the labors of Rutherford and his colleague Vignal who found that if injected into the duodenum that it increased the flow of bile, and that this flow was still more decided, if bile were already present in the duodenum. Ringer classes it with mercury and recommends its use, especially in minute doses, for the relief of the constipation that often succeeds a diarrhœa in the earlier months of life, when the stools are brittle, clay-colored, or tinged with green. He says no remedy so promptly restores the natural yellow color to the stools and brings back the proper consistency as podophyllin. For this purpose he says a drachm of alcohol should hold in solution a grain of the resin and a dose for the child should be two or three drops on sugar twice or three times a day. Its power seems chiefly expended in the duodenum, though its purgative action affects the whole intestine.

Rhubarb receives the double testimony of both Rohrig and Rutherford, and the latter says of it that it increased the quantity of bile, but did not exhibit any effect upon its composition.

Colocynth first and next to it in orders *jalaps* are listed as powerful

hepatic stimulants, the former increasing both the fluid and solid constituents of the bile.

Sodium phosphate, sodium and ammonium benzoates are among the more powerful of the drugs of Brunton's list favorably affecting the increase of bile. The former has found its chief use in children, when derangement of the liver has been indicated by whitish stools, or whitish stools tinged with green. Legg includes with the benzoates the salts of salicylic acid, following for his authority the experiments of Rutherford. The mode of action is very obscure, though it is probable that the peculiar anti-fermentative properties of these articles bear a prominent part in determining their action upon the liver. Bartholow has claimed for salicylate of soda the power of discharging the discoloration of the skin in cases of jaundice, after the bile has returned to its proper channel and the stools have again attained their natural color.

Iridin, *euonymin*, *phytolaccin*, *colchicin*, *sanguinarin leptandrin*, *hydrastin* and *juglandin* were all carefully studied by Rutherford. Of these, according to the summary of Wood, iridin purged as well as increased the biliary secretion euonymin, sanguinarin and colchicin powerfully affected the secretion, but the two first did not purge, the latter did. Of the others, phytolaccin is of use in this class, with double action, but leptandrin, juglandin and hydrastin were all feeble as hepatic stimulants and purgatives. No doubt these drugs deserve a more extended trial than they have received, and that the expectations of Rutherford for their beneficent effects will be more or less realized. Leptandrin, of this weaker class, has been more used in this country, though its place is a secondary one, and within the last year or two hydrastin has been pushed up and a more decided confidence in the result of its exhibition in biliousness claimed for it.

Colchicum has been long accepted as a valuable remedy in gout, and the essential pathological feature of this disease being the excess of lithic acid, its place as a curative agent may be dependent upon its influence upon the liver, by its stimulation effecting the elimination and preparing for excretion in this organ the uric acid that is in excess. In addition and probably as a supplement to its action on the bile, it increases the flow of urine, its solid constituents as well as the watery portions, and aids cutaneous transpiration. It holds its place as a hepatic stimulant undisputed by any of the experimenters.

Ipecacuanha is classed among the more powerful of the hepatic stimulants, but its action has been seriously questioned. A very plausible explanation of its action, and one that has gained much support, is that its effects are spent upon the mucous membranes of the ducts, producing a thinner secretion of mucus, opening these channels and allowing the bile to flow out into the intestines more rapidly.

There is to be considered among the stimulants to the biliary secretion a number of influences which probably deserve mention in this connection. The ingestion of food, and the formation of acid chyme which is emptied from the stomach into the duodenum, both independently of each other and by the combined action of the two, increase the amount of bile. Muscular exercise—rapid walking, rowing or running, especially in athletic sports that require much and rapid change of position—all efforts that increase the action of the diaphragm—show a power to increase this secretion apparently, although the cause of the appearance of more of the bile in the intestine, or in a hepatic fistula, was very well explained by the statement that these movements only expelled from the ducts and gall-bladder the stored up bile more thoroughly than would have been done otherwise.

This rapid summary of the list leaves us only to mention, before entering into the discussion of the mercurials, the salines—*Rochelle, Epsom and Glauber Salts.* But the influence of all these over the liver is very slight.

The consideration of the mercurials for the purposes in which we have indicated the use of the other drugs, brings in two prominent thoughts—the experience of the physician and the work of the experimental physiologist. In the discussion of the merits of these preparations of mercury, hardly any assertion has been made that has not been severely criticised and questioned, and out of the discussion grew the valuable works of Rohrig, Rutherford and Vignal, and John Hughes Bennett's Edinburgh Committee. I hope I shall not draw too long upon your patience by offering a concise statement of the arguments in the matter. They seem so full of instruction that a repetition of them ought never to be out of place in such a paper as this.

According to Legg, from whose work on "Bile Jaundice and Bilious Disorders" we shall obtain such statistics as we may present, and to which work we are indebted for much of the information on which we have founded this essay—according to this author, Hermann Nasse, of Marburg, in 1851, was the first to study the effects of drugs, and especially calomel, on the secretion of bile. The flow of bile into the intestines and the quantity appearing with the stools was so difficult of determination that he adopted the plan which has since been used as the only correct one, to settle the questions involved in this issue, that is, the measuring of the bile poured out of a biliary fistula. His plan consisted in feeding a dog on a uniform diet, which was supposed to be bread and potatoes, from the 6th to the 15th of the month, (it was in November) and to each meal carbonate of soda was added. Between the 24th and 27th of the month, within thirty-six hours, ten grains of calomel was given to the dog. On the first day the animal ate but little; on the second, the food was untouched at noon, but on the third day he ate all that was set before him. The quantity of bile was

lessened on the first day, but increased the last two, apparently with the accumulation of the calomel. The amount secreted and gathered from the fistula for eight days before the administration of the medicine showed a mean of 126.6 grs. of fluid bile and 2.88 grs. of solid bile, as compared with the mean of the two last days of the dosing with the calomel of 212.5 grs. of fluid bile and 4.38 grs. of solid bile. This points directly to an increase.

Kolliker and Muller waited until the twenty-sixth day after the fistula was established, and in the forenoon of the day gave four grains of calomel. Five observations in the afternoon showed a decrease of the bile below the normal. Two later experiments showed the bile thick, brownish and lessened in quantity. But Legg does not attach much importance to these results, as the dog was sick, had an exhausting diarrhœa and would only take as food bread and milk.

In 1858 Dr. George Scott set up a biliary fistula in a dog and calculated the amount of bile, fluid and solid, secreted, first in twenty-four hours without calomel, and then in the same period with calomel. Without going into the details of his experiments, the conclusion he reached was that a diminution, and not an increase, resulted after large doses of the mercurial, and that the quantity of food taken did not influence the secretion so as to affect the value of his experiments.

The Edinburgh Committee, under the lead of Hughes Bennett, do not agree with the experiments of Dr. Scott, whose experiments, by the way, were made in the laboratory of Dr. Lionel Beale. They think the decrease in the bile is not as great as he thought it. In beginning their work they set out with a check experiment to prove that mercury would have the same action on dogs as on men, and to this end they injected under the skin of dogs corrosive sublimate. This was followed by a discharge of mucus from the nostrils, fœtid breath and sore gums, and these results appeared alike in dogs in which no biliary fistula had been made and those that had been subjected to this operation; but in the former lot a profuse diarrhœa ensued, but was less marked or absent in the latter. So far they claimed the effects of mercurials on the dog and man are identical. Trials were then made with blue pill and calomel, the latter being used in both large and small doses, with a result pointing certainly to no increase of the secretion, and probably to a diminution. Corrosive sublimate was used with a like result, but all of the animals seemed to have succumbed early to the effects of the drug, and in none of the cases does it appear that they maintained for any length of time even a moderate amount of strength or health. Next in order of time come the experiments of Rohrig, which were published in 1873. He pursued a different plan from all former experimenters. Previous to his undertaking the work, the mode of management was practically as follows: A biliary fistula being set up in a dog, sufficient time was allowed for the animal to regain his health

and the amount of bile passed in a series of days was calculated and a mean established. Then the same series of measuring was followed up after the exhibition of a drug—generally a mercurial—and a mean of these struck. But Rohrig, and after him Rutherford and Vignal, first curarized the dogs and rabbits used for experiments until they were motionless, and to preserve life artificial respiration was practiced. Great regularity was found necessary in the performance of this practice for it appeared that any change in the breathing led to a difference in the manner of the expulsion of the bile. "A glass canula was inserted into the common duct, the gall-bladder was pressed upon so as to fill the canula with bile, and the cystic duct was clamped to prevent the return of bile into the gall-bladder." Thus all the bile passing through the hepatic duct escaped through the canula. This was carefully collected. The movement of the secretion and its quantity was measured or judged by the number of seconds between the fall of the drops from the canula. Rohrig says that after large doses of calomel the bile will again flow, after it has completely stopped, and he believes that it will increase the secretion if it has only been diminished; but he does not think its power is in excess of that of sulphate of magnesia, which he claims is a feeble stimulant. As he only made one experiment on the latter point, Legg dismisses the opinion as unworthy of much respect.

In 1875 Rutherford and Vignal published their experiments and the findings of these gentlemen have been taken since as the basis of all the discussions and opinion of the profession since. They only varied Rohrig's method by collecting the bile in finely graduated tubes instead of counting the drops by the seconds. The animals were curarized and treated as in Rohrig's experiments, and the records show these results: The injection of ten grains of calomel into the duodenum caused an increase of the secretion, the measure two hours before the injection being 3.35 C. C., and two hours just after 4.72 C. C. The result in two other experiments varied from this, as no increase appeared in one of them and a decrease was noted in another. In three other experiments, in one there was no increase, in one a decrease, and in one an increase, but this had begun before the drug was given. The addition of bile to the calomel did not affect the amount secreted. As these injections had been made into the duodenum and had not been subjected to the acid of the stomach, and as it was suggested that probably the influence of this acid on the calomel was to change a portion of it into corrosive sublimate, experiments were made with the bichloride of mercury. Without the addition of bile to the solution of the drug, a small increase appeared; but when this fluid was added in two experiments, in the first an increase was noted, and in the second the result was very marked. In reviewing the opinion of these experiments, that it is the portion of calomel changed by the gastric juice into cor-

rosive sublimate that is the effective part of the drug as a hepatic stimulant, Legg says he does not think the question has been answered, and leaves the point open. We have seen the opinions of these experimenters on the other drugs, which were made in the course of the examination of the action of calomel and the other mercurials. H. C. Wood sets out all these facts and says that these evidences do not warrant any positive deductions as to the effect of purgatives upon the biliary secretion of dogs that are healthy, and that these facts must be laid aside or received with much reserve when we are studying the action of hepatic stimulants on man, and that our conclusions will be more safely based on clinical evidence. As mercurials in health increase the flow of bile, and if it has been suspended or diminished, will renew it or increase it, the conclusion seems to him inevitable that it must have a directly stimulating effect on the biliary secretion. The objection that the increase follows as an effect of the increased peristalsis set up by the mercurial, causing the expulsion of the bile from the gall-bladder and its being swept out of the bowels without absorption, is answered, he claims, by the facts that the color of the action under the influence of a mercurial is restored when it is pale from arrested secretion, and often without producing a diarrhœa. Moreover, a diarrhœa existing with colorless dejections, a change of color following the treatment by mercurials, does not make an increase in the diarrhœa necessary, and there may be a decrease of liquidity after the exhibition of the mercurial at the same time as the improvement is observed in the color. Other drastic purgatives, more potent than the mercurials, fail to accomplish the result that is justly expected of a mercurial. And lastly, a diarrhœa does not cause bile to appear in an increased amount in the dejections. Bartholow does not deny the increase of the bile, but he regards it as a pathological phenomena. While he admits that the action of the mercurial may be stimulating by its direct action on the hepatic cells, the increase of normal bile is by no means beyond dispute. He believes that the increase of bile in the passage from the bowels is simply the result of the irritation caused by the presence of the purgative mercurial in the duodenum and its reflex stimulation to the gall-bladder, with a consequent contraction of that viscus and an extrusion of the bile stored in it. He does not think that the stimulating power of the mercurial is above that of the resinous cathartics or Croton oil. Sidney Ringer rapidly presents the conclusion of the experimental physiologists, and in answer says: "Yet the experience of generations strongly supports the general conviction that in some diseases calomel, as well as the other preparations of mercury, does increase the bile. Moreover, it is not difficult to conceive that in a given disease, mercury may set aside some condition hindering the formation of bile, and then act as a cholagogue, (hepatic stimulant), though possibly in health it might

check the secretion." Harley, in the portion of his work on the liver devoted to the general treatment of disorders of this organ, has this to say: "The first remedy to which I shall your attention is the well-known, old-fashioned mercurial, which after having been in general use among all ranks and classes of society for generations, may still be looked upon as the physician's mainstay in the treatment of the majority of liver cases. Every housewife knows that a dose of calomel at bed-time, followed by black draught in the morning, will suffice in the majority of cases to cure an attack of biliousness, and that, too, within twenty-four hours after its administration. At the present moment, however, a change has come over the spirit of the physician's mercurial dream, and the poor old drug has been placed at the bar, like a suspected criminal on trial, on account of experimental physiologists having found that when administered to the canine species, it does not behave itself in what according to old-fashioned ideas might be called an orthodox manner." He denies that mercury in any form can increase the secretion of bile, no matter whether the dose be large or small, providing the liver is in a healthy condition; but he says the apparent increase is simply the emptying of the gall-bladder, caused by the reflected irritation of the duodenum. While admitting that there is sufficient evidence derivable from physiological sources to prove that mercury has no power to stimulate the normal liver to secrete bile, he firmly asserts the truth of the statement that in certain cases of diseased liver, where the biliary secretion is retarded and diminished, or even arrested in consequence of a congested condition of the tissues of the liver, mercury has a powerful effect in increasing this secretion and restoring it to an amount approaching the normal. His explanation of this power which is indirectly applied to the hepatic cells, is the antiphlogistic effect of the drug in question on the hepatic capillaries, such being the influence upon these vessels that a cessation of the congestion follows and relief from pressure allows the hepatic cells to assume their normal work. The fact that an increase follows the administration of the mercurial is admitted, the floundering of these speculators as to the mode of producing the result only remotely interests us until there shall be such a decided opinion justified as to deserve a general following. Legg says the action is through the nervous supply of the liver, after he has satisfactorily to himself explained away all other methods of accounting for the stimulating influence of the mercurials.

The practical pointed remarks of Fothergill seem to form an excellent conclusion to this essay. He has been discussing the abuses in the indiscriminate employment of mercury and deprecating these irrational methods of practice, at the same time he sees in the reaction a wide-spread and unwarranted skepticism as regards drugs for any purpose, "while an unbounded faith in beef tea and the sustaining plan

of treatment now generally obtains" with the anti-mercurialists. "Nevertheless, in many cases a mercurial and a saline afterward form a very good plan of therapeutic attack in emergencies. Nor does this confession of faith in mercurials as a cholagogue involve a retrograde movement, which will extend to resuscitation of a belief in witchcraft or the tenets in Druidism. To advocate the proper use of mercury as a cholagogue is not the revival of an exploded superstition. Potent for good, still more potent for evil, when abused, mercury has fallen from its high estate into comparative disgrace and neglect. Its claims however must be considered rationally. Highly as it was once extolled, it is now equally abused and depreciated. The reaction actually extended to the point of abandoning mercury in the treatment of syphillis. Slowly the tide of indignation against the use of mercury has ebbed, until its use in syphilis is once more universal."

Still further on Fothergill says: "The late Prof. Hughes Bennett hated mercury with a virulence scarcely conceivable by those who did not know him. He denounced it, he inveighed against it, he poured all the power of ridicule he possessed, and that was no small amount, upon it; he shot every arrow of sarcasm in his quiver, and it was a pretty fully one, at the misguided, wicked persons who dared to advocate the administration of one grain of calomel. Peace to his ashes! an iconoclast, he did good service in his way. The crusade against mercury is now passing away, and its rational use is finding advocates everywhere. In speaking of the use of mercury in liver disturbances Dr. Budd wrote: 'The marked temporary benefit often resulting from mercury given for this effect has, from the difficulty of distinguishing the various diseases of the liver, and the consequent indiscriminate use of the drug, led to great evils.' The way in which German writers have condemned the English use of mercury has done much to help on the growing disuse of the drug; their condemnation has been wholesale, thorough-going and indiscriminating itself, and has been sometimes the blatant utterance of ignorance as well as at times genuine, honest criticism."

Dr. Murchison has put the position of mercury very pointedly. After giving the results of numerous experiments he proceeds: "Mercury and allied purgatives produce bilious stools by irritating the upper part of the bowel and sweeping on the bile before there is time for its reabsorption. It would appear that mercury, by increasing the elimination of bile and other products of disintegrated albumen circulating within the portal, is, after all, a true cholagogue, relieving a loaded liver far more effectually than if it acted by merely stimulating the liver to increased secretion as was formerly believed, and as some authorities yet maintain—for in this case it might be expected to increase instead of diminishing hepatic congestion" Here he differs entirely with Harley, but he goes further: "It is not impossible that the good

effects of mercury on the liver and in some forms of inflammation may be due to its property of promoting disintegration. But in whatever way it is to be explained, the clinical proofs of efficacy of mercury in certain derangements of the liver are to my mind overwhelming. I say so more advisedly, because I was taught to regard mercury as a remedy worse than useless, not only in hepatic diseases but in syphilis; it cannot therefore be said that the convictions forced upon me are the results of preconceived opinion." And here Fothergill leaves Murchison with these remarks with which we shall dismiss the subject: "Dr. Murchison was a pupil of the late John Hughes Bennett. So was I; and I can also plead that my belief in mercury has been forced upon me by experience, for Bennett's thundering diatribes dominated my mind for a long time, and the impression made by him on my youthful mental forces was only ground out by the resistless action of accumulating experience."

MALARIAL HÆMATURIA.

By Julian M. Baker, B. S., M. D., Tarborough, N. C.

Since the close of the Civil War, our medical literature has abounded in reports of a disease considered of malarial origin, and having for its most prominent features jaundice, dark urine, nausea, great depres-

ERRATA.

On page	123,	17th	line	from bottom	for	"*sam.*" read "*same.*"
" "	123,	13th	"	" "	"	"*fevere,*" read *fever.*"
" "	123,	9th	"	" "	"	"*consider,*" read "*considers.*"
" "	123,	first	foot	note	"	"*Urine,*" read "*Liver.*"
" "	131,	11th	line	from top	"	"*cardiac,*" read "*pyloric.*"
" "	131,	3rd	"	" bottom	"	"*wadlets,*" read "*rodlets.*"
" "	133,	3rd	"	" top	"	"*Langi,*" read "*Lanzi.*"
" "	133,	12th	"	" "	"	" " "
" "	133,	12th	"	" "	"	"*Berito,*" read "*Poroneito.*"
" "	134,	14th	"	" "	"	"*induction,*" " "*inductive.*"
" "	134,	19th	"	" "		omit "*is*"—doublet.
" "	135,	18th	"	" bottom	"	"*diserse,*" read "*disease.*"
" "	138,	15th	"	" "	"	"1866," read "1886."

the disease. Still later, in the writings of Lantter, Torti, Tissot, Senac, and many others, a disease is described characterized by suppression of urine, coma, convulsions, congestion of brain, lungs, liver, spleen and kidney, and hemorrhage from kidney and bowels, and in this is recognized the similarity to Malarial Hæmaturia as it exists with us, or so nearly resembling it, that little has been gained by progressive development. Senac, who was physician to Louis XV. with extensive and accurate observation on urine, in 1769, after referring to the red appearance, regards the settling to the bottom of vessels of a white matter as a favorable sign. Alibert, in 1807, in his treatise on malignant fevers, calls attention to the condition of urine, saying: "The diminution in quantity and the assuming a black color is an alarming symptom."† Various writers at different times have recorded

*Cels. De Medicine.
†"Treatise on Malignant Intermittents." J. I. Alibert.

the remarkable fatality of malignant fevers in Java, Guinea and hot climates, accompanied by hemorrhages, and according to Lind, this is the disease most to be dreaded by Europeans visiting the Tropics.* In the putrid remittent of writers of the first half of the present century, accompanied by nausea, vomiting dark matter containing bile, sometimes hemorrhages from eyes, nose, bowels or kidneys, yellow skin, black urine, and great mortality, clearly the essential character of Malarial Hæmaturia is exhibited.

More credit is probably due Professor Jones, of New Orleans, than anyone else for determining definite pathological facts and a scientific and exhaustive study of the disease. According to Jones, the first case published in this country was by C. Gidden Young, M. D , of Greenwood, La., in October, 1843, and reported as a case of Intermittent fever, with periodic hemorrhage from kidney.† R. H. Day, in a paper read before the Louisiana State Medical Society in April, 1886, combats the idea of recent development and affirms that he met with the disease in 1837, in the bottom lands of Wabash and White rivers in Indiana and Illinois. He maintains that "It is a miasmatic disease, caused by malaria, whatever that undefined and as yet undetermined fever poison may be. Its occurrence in the same localities in the same seasons of the year; its striking resemblance and strongly marked physiognomy to Malarious Bilious fevers, endemic in those sections, and its general amenability to the same therapeutic agents, reveals its kinship, stamps it as allied to, and of common origin and nature with them." Cases were reported to the Alabama State Medical Society in 1850, by Dr. T. H. Anderson. It was recognized in 1855 by Oxamendi and Nunez in the West Indies, always occurring in swampy and malarious districts, and when cured at all, cured by Sulph. Quinia.

Dr. James Copeland, in his Dictionary of Medicine, published in 1855, says: "Periodic Hæmaturia is not uncommon in malarious climates."

The first to carefully investigate the pathological lesions of the disease was Dr. Freid Theod Frerichs. He established the fact of its existence in Breslau in 1854. In his work on diseases of the liver, the pathological changes of Malarial Hæmaturia are recognized in the "Pigment liver," "Melanæmic liver," etc. His classification of malarious fevers with pigment liver, as observed at Breslau, was as follows:

I. Cases with predominant brain symptoms.

II. Cases in which the kidneys are prominently implicated.

III. Cases with predominant derangement of the gastro-intestinal tract, and of appertaining organs, but particularly the liver.

IV. Those forms in which local derangement is not conspicuous, but Anæmia and Hydræmia, resulting from derangement of spleen, con-

*"Diseases Incidental to Europeans in Hot Climates." Dr. James Lind.
†"N. O. Med. and Surg. Journal," Nov., 1845.

stitute most important symptoms. In these cases the pigment in the blood is of subordinate importance, inasmuch as its quantity and character do not give rise to extensive lesions of capillary circulation.*

The second class, "Cases with predominant affection of kidney," is of special historical interest. In that class of cases, "The urine was deep reddish brown, and coagulated upon boiling or addition of nitric acid, pulse was from 80 to 120, and much complaint of headache and great depression. Post-mortem showed the spleen large, soft and darkly speckled, liver normal size, surface smooth, margin sharp, its parenchyma loaded with greyish brown pigment, bile pale and copious, kidney lobulated and on section presented a homogeneous, brown, glistening surface. There were numerous pigment cells and scales in the glomeruli of malpighian tufts; bladder contained bloody urine."†

These observations agree substantially with those of Jones in 1857, and show that profound lesions of liver, spleen and blood precede and accompany malarial diseases.

From the observations of Frerichs and of Jones, we learn that the pathological changes of all forms of malarial fever are uniform, and consist essentially in "Diminution of colored blood corpuscles, deposit of pigment in liver and spleen and increased secretion of bile."‡

The composition and amount of urine was found to vary with stage, intensity and type of disease. Jaundice, bilious vomiting and dark brown or black urine was observed in the gravest cases.

From this brief historical allusion we are forced to conclude that Malarial Hæmaturia or Hæmorrhagic Malarial fever is not a new disease, but its recognition as a distinct type is modern. The same symptoms and signs were recognized more than two thousand years ago, but only since 1866 or '67 has it been given so dignified a place as a separate and distinct type in the classification of diseases. It was before that time considered a complication of other forms of fevere nevertheless, its essential characteristics were known to Greek, Roman and Arabian physicians. American authors, with few exceptions, even now fail to give it the place in their works which our experience consider it should have; this is owing to the fact, not that it is a new disease or a rare one, but that it exists only in a limited area of territory, and the medical men of that portion of the country are not generally book-makers, and when articles have appeared from physicians living in those sections in which it is prevalent, the effort was not to the determination of definite pathological relations, but more to outward symptoms and treatment.

Descriptions of the disease have appeared under various names in the periodical literature of the last twenty years, such as Recurrent

Liver

*"Clinical Treatise on Diseases of the Urine."
†Ibid.
‡"Med. and Surg. Memoirs." Joseph Jones, M. D.

Malaria Hemorrhagica, Epidemic Jaundice, Hemorrhagic Malarial fever, Icteroid Pernicious fever, Malarial Hæmaturia, Country Yellow fever, etc. The most appropriate name, it seems to me, is Endemic Hæmaturia, but I shall adopt the nomenclature now generally accepted.

There has occurred in this section a number of cases having the general characteristics of Malarial Hæmaturia as reported from other sections of the country, but with slight specific differences.

Instead of following the usual course and generalizing as to symptoms, course, duration, &c., I will select a few cases that have come under my charge recently, and which I consider typical of the disease in this section. The general deportment may be drawn from the following:

CASE I.—Mrs. E., white, aged 32, mother of five or six children, a strong woman, residing about four miles from town in a section not specially malarious, (but intermittent and remittent fevers had occurred occasionally on same plantation during present fall,) in about one mile of Fishing Creek, on an elevated place. Patient had dark hair and eyes, and had led the life of an ordinary housewife of moderate means for years. Had had one attack, similar in all respects to present one, several years previous, from which recovery had been complete.

Was taken suddenly on September 15th, 1885, at 7 A. M., with severe rigor, which soon passed off, and was followed by reactionary fever. I was called on the following day about 9 A. M., when the above history was elicited. Patient was of a deep golden color, lips, conjunctiva and tongue pale and anæmic, with the same golden appearance. She was suffering with intense nausea and cephalalgia. There was anorexia, great uneasiness and anxiety of countenance, skin cool and clammy, tongue furred and dry. Pulse 134; Temp. 100⅕° F.; Resp. 28. Bowels constipated, urine scanty and of dark brown appearance; vomited matter of a deep yellow color, staining every article with which it came in contact; expectoration of same golden hue. She had passed the black urine and vomited yellow matter since the day previous, when first taken. It had continued without cessation up to time of visit. There was slight enlargement of liver and spleen, with tenderness over these organs, and upon firm pressure in lumbar region. Diagnosed Malarial Hæmaturia, and urine taken home for examination. The following was the result: Specific gravity, 1,014; color, dark reddish brown; reaction, acid; estimated quantity in previous twenty-four hours, 20 or 25 ozs.; albumen estimated 20 per cent.; no sugar, but an abundant dark brown deposit. Under the microscope, this deposit was found to contain the following: Crystals of uric acid, a few of urate of soda and amorphous phosphates; also coloring matter of blood and bile, with a few colored blood globules, swollen, distorted, broken or shriveled, and pus corpuscles. Blood and epithelial casts of straight

and convoluted tubules and an abundance of kidney epithelium, with some from bladder, vagina and mucosa of uterus. An acute croupous, hæmorrhagic nephritis, with slight cystitis, vaginitis, and inflammation of endometrium. The two latter probably having existed prior to present attack.

September 27th, 9 A. M. Passed a very restless night, delirious and semi-comatose; when aroused expresses great anxiety and seems to realize the gravity of the disease. Pulse 130; Temp. 99⅘° F.; Resp. 30. Grave symptoms of previous day continue; urine still dark; stomach little more quiet; marked cerebro-spinal disturbance. Estimated quantity of urine in past twenty-four hours, 22 ozs; specific gravity, 1,014; same morphological characteristics as day previous. Bowels moved freely from cathartic administered previous visit. Treatment then inaugurated, and which is detailed later on, was continued.

September 27th, 9 P. M. Pulse 123; Temp. 99⅘° F.; Resp. 24. No perceptible change, except takes nourishment more freely and stomach more retentive of both food and medicine. Coma seems to be deepening.

September 28th, 9 A. M. Temp. 98° F.; Pulse 140; Resp. 30. Attendants say had one or more convulsions during night, and had passed no urine since previous visit, catheter removed about two ounces of urine, similar in all respects to that previously voided; specific gravity of this 1012; coma profound; skin cool and clammy, and every indication of approaching dissolution. About 2 o'clock P. M. there seemed to be an effort to rally; four or five ounces of nearly clear urine was passed; specific gravity 1010, but differed from that previously passed only in containing less biliary and blood coloring matter. In a few minutes she again fell into the profound coma, with frequent convulsions, and died about 6.20 P. M. Cause of death in this case was undoubtedly uræmic poison from suppression of functional activity of kidney by the structural lesions of acute croupous nephritis.

Case II.—Mrs. B. E., a sister-in-law of Case I, living in same section, one quarter of a mile distant, 33 years old, blonde, widow, four children. Had lived at present abode seven or eight years, and had had a previous attack before moving here, while residing in another part of the country. Had had chills and fever for a week prior to present attack, for which large quantities of sulph. quinia had been administered. Was called in on August 4, 1886, 12 M. Present attack had come on gradually, symptoms increasing in severity from day to day, until at the time of my first visit I found marked jaundice, skin of a golden yellow color, lips, tongue and conjunctiva all colored, intense pain in lumbar region, urine scanty, of characteristic dark brown color, staining sides of vessels yellow when tilted from side to side, bowels constipated, nausea, and vomiting characteristic bilious matter, tenderness over epigastrium and hypogastrium not marked but some

slight enlargement of liver and spleen, no cerebro-spinal disturbance, mind perfectly clear and composed. Pulse 118; Temp. 102° F.; Resp. 24. Examination of urine—specific gravity 1016; contained salts of urea, some simple and triple phosphates, albumen, hyaline, epithelial and blood casts of tubuli uriniferi, epithelia from kidney tubules, coloring matter of blood and bile, disintegrated blood corpuscles, but some few intact, and pus, indicating acute croupous hemorrhagic nephritis with a constitution much impaired, but not to the same extent as in Case I. Estimated quantity of urine in twenty-four hours 30 ozs.

August 13th, 9 A. M. Stomach more quiet, retains both food and medicine generally. Pulse 114; Temp. 98½; Resp. 24. Slept two or three hours during previous night. Bowels moved copiously by cathartic; jaundice not so marked; urine slightly clearer; specific gravity 1016; estimated quantity in twenty-four hours, 18 or 20 ozs; still contains albumen, casts of tubuli uriniferi, coloring matter of bile and biliary acids and blood, in fact, same as day previous, except in diminished quantity.

August 14th, 9 A. M. Patient much improved, jaundice almost entirely gone, urine considerably clearer, although still contains albumen, coloring matter of bile and blood and casts; specific gravity 1016. Patient passed a very good night, takes food and nourishment sufficient, bowels kept open by cathartics, tenderness over epigastric and hypogastric regions has entirely disappeared. Pulse 95; Temp. 99° F.; Resp. 20.

August 15th. Improvement continues; still very much prostrated, so much so as to be unable to turn in bed without assistance; jaundice disappeared; urine nearly clear. Pulse 95; Temp. 99⅕; Resp. 20.

August 16th. Improvement continues; urine clear; contains no albumen or casts; an abundance of salts of urea; no coloring matter of bile or blood; specific gravity 1017; bowels still constipated and moved only by cathartics. From this time on, under a general tonic treatment, in two or three weeks patient was entirely restored to health.

It is common to have cases progress favorably, as this one did up to the 17th, and when we begin to congratulate ourselves on the favorable issue, to be suddenly summoned to the bedside to find either that death has already taken place, or does in a few minutes after our arrival.

The urine not becoming dark again, or other indications of fresh malarial absorption, death in these cases is due to cardiac thrombosis, which is the result of the hyperfibrinated condition of blood due to malarial poison.

In Case II, on August 20th, urine again became dark, with a return of nausea, but on being voided a few hours after it was again clear, and there was no interference whatever with the steady progress toward recovery.

CASE III.—Arthur E., nephew of preceding cases, residing in same locality, about one mile distant, blonde, aged 15, has resided at present abode all his life. Had an attack previously, while on a visit in an adjoining county, several years ago, from which he recovered, and since then has suffered almost continually with headache; otherwise healthy and strong. Had a few chills immediately prior to present attack. Was called early on the morning of November 11th, 1886; found skin golden yellow, lips, tongue and conjunctiva same; nausea intense; restless, anxious, great prostration; jaundice ushered in night previous by a severe rigor, which lasted an hour or more, when urine became cloudy and scanty; at the time of visit it was almost black. Was unable to retain anything on stomach, vomited matter that stained everything yellow, and at times, black; pain and tenderness in lumbar, epigastric and hypogastric regions; there was slight enlargement of liver and spleen; no disturbance of cerebro-spinal centers; tongue dry and covered with a dark fur. Pulse 130; Temp. 100° F.; Resp. 22. Examination of urine showed specific gravity 1017, albumen, casts and epithelia of the tubuli uriniferi, crystals of urate of soda, uric acid and a few amorphous phosphates, all stained with coloring matter of bile and blood, no blood corpuscles, but a few pus corpuscles; estimated quantity in twenty-four hours, 36 ozs. Bowels constipated and cephalalgia intense. Numerous bacteria were observed in urine, although examined a very short while after being voided. Vomited matter contained biliary acids, biliverdin and cholesterin, epithelia from mucosa of stomach and bile ducts and disintegrated blood corpuscles.

November 12th, 9 A. M. Pulse 130; Temp. 97° F.; Resp. 20. Passed a restless night; urine still black; vomiting continues; icteric hue not so deep; takes no nourishment by mouth; bowels moved freely during night by cathartics; composition of urine same as previous day; passed larger quantity, estimated at 38 ozs. in twenty-four hours; specific gravity 1017.

9 P. M. Skin decidedly clearer; urine passed more copiously, but still dark colored; nausea ceased almost entirely; able to retain both food and medicine; urine not examined. Pulse 112; Temp. 98⅘° F.; Resp. 21.

November 13th. Somewhat better; skin decidedly clearer; no return of nausea; urine still dark colored; passed about 40 ozs. in last twenty-four hours; still contains albumen, casts, etc. Pulse 114; Temp. 98° F.; Resp. 19.

November 14th. Improvement continues; urine slowly clearing up; regaining strength very slowly; skin perfectly clear; passed a tolerably quiet night; bowels moved by cathartics. Pulse 112; Temp. 98½° F.; Resp. 19.

November 20th. Improvement has been gradual since last report;

urine gradually becoming clearer until it is perfectly so, and contains albumen or casts or coloring matter of bile or blood; no return of nausea. Pulse 102; Temp. 97° F.; Resp. 19. Still unable to move without help.

November 21st. Urine again became cloudy, but no other indication of a relapse. It contained no albumen.

November 22d. Urine has again become clear; gained some strength; takes food with a little less reluctance. From this time on the case has progressed satisfactorily, without an untoward symptom, the only feature worthy of note being the slowness with which strength was regained, it being fully two months before the patient was able to walk, although requiring no attention other than a general tonic treatment.

A fourth case is reported, not because of any special clinical difference from the preceding ones, but because in it a post-mortem examination was made, and on the result of that the ideas as to pathology subsequently expressed are in the main founded.

CASE IV.—Rufus W., a negro man, 40 years old, strong, robust, athletic, a farm laborer, residing about four miles from town, near low grounds of Tar river. Was taken suddenly while at work in the field, picking cotton, on October 13th, 1886. Had a chill in the afternoon and returned to the house. At night, in a semi-conscious condition, he undertook to go out the door to void urine; in the effort it was noticed by his companions that a quantity of bloody urine was passed along the floor, from bed to door; immediately a physician was sent for; upon arrival patient was found delirious, with great prostration. Pulse rapid and feeble, 120; Temp. 100⅕° F.; Resp. 22.

The black skin did not show the icteric hue, but conjunctiva, lips and tongue were of characteristic color; urine scanty and dark reddish brown, and passed unconsciously in bed; contained some morphological elements as in preceding case; agonizing nausea and obstinate constipation.

October 14th. Considerably worse; pulse so weak and quick as to be scarcely able to count; Temp. 97° F.; Resp. 33. Urine passed unconsciously and of same character as before; nausea continues; greater prostration; skin cool and clammy.

October 15th, 9 A. M. Prostration still greater; died about 2 o'clock P. M., being about forty-eight hours from time first taken. Post-mortem four hours after death; result is given further on.

Before giving the results of my own study as to the nature and pathology of the disease, let us briefly review the prevailing idea in regard thereto, then compare with my own and see wherein they differ and wherein the observations of others are corroborated.

The principal pathological lesion is in the liver, spleen and kidney, only such changes being found in other organs as would naturally

occur from a radical derangement of these three. According to Prof. Jones,* these organs exhibit the same changes as are found in other forms of malarial disease. His post-mortem examinations reveal that the liver is enlarged, slate-colored exterior and deep bronze interior. Microscope revealed a number of dark, brownish red and black pigmentary particles, similar to those in other forms of malarial fever. In other cases the liver was a Spanish-brown color, and not of the deep slate exterior and bronze interior, characteristic of malaria. The pigment particles in these cases were present, but in less quantity, sometimes, also, oil globules in larger quantity than in a normal malarial liver. In the former class there was no deposit of yellow granular matter, the dark pigmentary deposits were most abundant in portal capillaries of hepatic lobuli; liver cells pale.

Spleen presented a purplish appearance and all the characteristics of a malarial spleen. In other cases the spleen contained fewer pigment particles than is found in bilious remittent fever.

The kidneys presented slate-colored spots on exterior and were greatly congested. Upon section, blood vessels to smallest capillaries were filled with coagulated blood, also altered blood globules and granular matter deeply colored with hæmatin; texture softer than normal. Many of the capsules of the Malpighian bodies filled with coagulated blood, blood corpuscles and deep red fibrous matter.

Pigmentation takes place in kidney also, but in some cases to a very limited extent.

The same authority finds the serum of the blood of golden yellow color, containing coloring matter of bile and biliary acids. The deep golden color of serum is caused by bile pigment and imparts the golden hue to skin and conjunctiva. Coagulum firm; separation between clots and serum perfect; clots floated in the golden colored serum. Under a magnifying power of 420 there was seen numerous dark granular masses, dark spherical bodies resembling spores and pigment cells from two to four times the size of white blood globules. Many of the colorless corpuscles contained numerous pigment particles.

1000 parts of blood contained:

Water	820.50
Dried blood corpuscles	86.47
Fibrin	4.50
Saline matter	7.18

Extractive matter of serum contains urea, coloring matter and biliary acids in larger quantity than normal blood. The relative number of red blood globules is diminished and liquor sanguinis increased. The quantity of fibrin is increased, indicating an inflammatory condition of this fluid as well as the kidney.

*"Medical and Surgical Memoirs."

Urine contains in variable quantity urea, uric acid, phosphoric acid, sulphuric acid, chloride of sodium, and albumen, coloring matter of bile and of the blood, and biliary acids. Microscopically examined it was found to contain cast of tubuli uriniferi, stained orange yellow and reddish brown from coloring matter of bile and blood, masses of altered hematin, blood corpuscles variously altered in shape, and sometimes yellow granular matter.

My own observations have, besides the clinical features, included chemical and microscopical examinations of urine and vomited matter, post-mortem examination and microscopic examination of liver, spleen and kidney. They were made upon eight or ten cases, coinciding in every material particular with the typical cases detailed above. In some respects my investigation leads to results different from those farther South, but it will be seen in most essential characters they are the same.

Whether this difference in results is due to an actual difference in the disease in the two localities or whether the difference arises from my imperfections, I cannot say.

In all cases in which accurate records were kept and investigation carried out, the same pathological changes were noted, the only variation being as a rule in degree. I have met with no case in which there was hemorrhage from other parts than the kidney, except in a few cases where there was slight hemorrhage into cavity of stomach as evideneed by presence of blood in vomited matter. This was inconsiderable and did not attract much attention.

The vomited matter contained biliary acids, cholesterin, biliverdin, epithelia from mucosa of stomach and bile ducts, sometimes altered blood and a peculiar form of micro-organism, which will be more fully spoken of hereafter. Urine invariably contained epithelial and blood casts of straight and convoluted tubules, coloring matter of bile and blood, and epithelia from tubuli uriniferi, all colored yellow or brown. Sometimes, though rarely, there were a few red blood corpuscles; generally they were broken down and disintegrated, characteristic of the depressed vital state. It contains also salts of urea in variable quantities, uric acid, sometimes simple and triple phosphates, was generally acid, and specific gravity varied from 1012 to 1016.

Various forms of bacteria are seen in urine in an incredibly short time after it is passed. I have always found them when examined as soon as could convey urine to office for examination. I cannot say urine contains the bacteria when passed, for my examinations were never made under an hour after it was voided; at any rate, if not present when voided, and if these bacteria result from fermentative changes or decomposition, then these changes take place in urine in a very few minutes after passing from the body. Post-mortem examina-

tion of Case IV, which corresponded in every essential clinical feature with other cases, was as follows:

Conjunctiva, lips, tongue and palm of hands deep golden yellow color; not much emaciated; well developed muscular system.

Thorax: lungs pale and anæmic, otherwise normal in all respects. Right ventricle distended with coagulum, otherwise appearance of heart was healthy. Abdomen: adipose tissue of abdominal walls colored deep yellow by coloring matter of bile; tissue softer and muscles redder than usual. Stomach contained a quantity of dark green matter; mucous membrane markedly injected, more noticeably near cardiac orifice; bilious matter mixed with a quantity of glairy, tenacious mucus. Liver slightly enlarged; upper and outer surface normal in appearance. When raised from its bed the whole under surface was a dark bronzed appearance, this bronzing breaking off abruptly at the inferior margin.

Upon section the lobules were pale and portal vessels brownish. Under microscope the epithelia of alveoli was seen to hold a dark brown, granular mass, some epithelia coarsely granular, nuclei concealed. Fat globules were noticed to a limited extent, but exact increment of oil not estimated; capillaries empty, but terminal portal vessels filled with altered blood. Throughout the structure the same peculiar-shaped micro-organism, noted in vomited matter previously, was seen. Gall-bladder distended with a quantity of dark green bile. Spleen somewhat enlarged, containing same dark brown, granular mass in splenic pulp, and also same form of bacteria noted in liver.

Kidney greatly congested, with dark bronzed, irregular shaped spots on exterior; under microscope tubuli uriniferi distended with epithelia; in some cases with blood casts or same granular mass seen in liver; Malpighian tufts enlarged, congested and in some places ruptured.

Specimens of liver and kidney were sent to Dr. C. Heitzman, New York, for a more complete microscopic examination. The following is from Dr. H.'s letter:

"Liver—portal vessels replete with blood, but no blood corpuscles are recognizable. In their stead there is a granular or lumpy dark brown mass so characteristic of dissolution of blood; capillaries of lobules are mostly empty; liver epithelia generally unchanged, finely granular and nucleated; near the border of the aveoli the epithelia are coarsely granular, their nuclei being concealed, and such epithelia hold a dark brown mass, coloring matter of the blood. Some epithelia also hold droplets of fat, but not in excess and not enough to call the liver markedly fatty.

"Both the intestinal connective tissue and capillaries hold peculiar wadlets of microbe, very similar to those of splenic fever in cattle, only a little more slender. In some places I have seen bunches of such bacilli arranged in shapes of leptothrix.

"Kidney—tufts slightly enlarged, the nuclei of their capillaries considerably augmented. Interstitial connective tissue crowded with inflammatory corpuscles in the stage of granular protoplasm; convoluted and narrow tubules are either choked with a proliferating epithelium yielding a number of inflammatory corpuscles, or they contain plugs of the dark brown granular mass seen in portal vessels and blood casts. Many tubules have lost their epithelia to a narrow rim around the basement membrane, others contain detached epithelia and pus corpuscles.

"The kidney is in an acute croupous, hemorrhagic inflammation. The blood disorganized as is usual in septic æmia." He goes on to say: "There is no reasonable doubt in my mind that the disease is primary neither in liver nor kidney, but is an infectious disease, caused by some microbe, nearly identical with that of splenic fever in cattle, that kills human beings also in a very rapid manner."

It will be seen from this that Malarial Hæmaturia has a definite and settled pathology and that it is characterized by profound lesions of the kidney and the alteration and destruction of red blood globules. Jones has shown that this destruction takes place in the liver and spleen. The fact of a peculiar microbe appearing in these organs raises the question of the influence of the micro-organism upon such destruction and to the subsequent kidney lesions.

Without denying the fact, as maintained by others, that the pathological changes in kidney are brought about by the action of biliary acids in blood, and their selective irritant action on kidney or by this destruction of blood corpuscles and consequent pigmentation of various organs, our investigation forces the conclusion that some causative relation should be ascribed the rod-like microbe seen in liver and spleen. That this destruction of red blood globues does take place has been abundantly proven both by chemical analysis and by actual counting with micrometer and by appearance of coloring matter in urine. The deposit of pigment is derived from this destruction, the hæmo globulin being decomposed, the hæmatin set free, these pigment particles are transferred through the circulation and deposited in various organs, producing a train of symptoms peculiar to the organ affected. The facts point then to the existence of a specific poison in Malarial Hæmaturia. The exact nature of this poison, whether only a malarial element exists or not, will require future investigation to decide. It has been and is now considered only as one of the manifold exhibitions of malaria. Malaria is an indefinite term to express an undetermined entity behind which our professional shortcomings and inaccuracy of ideas has taken umbrage for generations.

That the malarial poison is a living germ has been a prevalent theory in medicine since the time of Lucretius, but the isolation and determination of the real nature of the germ is not yet accomplished, not-

withstanding the investigations in recent years of such learned and distinguished microscopists as Mitchell and Saulisbury of our own country, of Belestra and Langi in Italy, Ecland in Sweden, and Klebs and Tomassi-Crudeli in Rome. While the results obtained by these observers differ as to the peculiar form of micro-organism, which produce malaria, they strengthen the theory that such an organism does exist, and confirm the belief that future observers will discover the true bacillus malariæ as has been done in typhoid fever, phthisis and many other diseases. The results obtained by Klebs and Tomassi-Crudeli deserve most attention and may eventually prove a satisfactory solution of the difficulty. Their observations have been verified by Marchiafava and Cuboni, by Langi and Berito; all these observers claiming to have observed the identical spores and bacilli in blood of malarious fever as those seen by Klebs and Crudeli. Lavaran finds parasitic elements that exist only in malarious fevers and they disappear under administration of sulphate of quinia. They are the same as pigmented bodies known as melantic leucocytes "It is a curved or cylindrical body, transparent with a pigment spot, sometimes motionless and sometimes active. The ultimate stage of development is a motionless spherical or irregular shaped body containing dark red, rounded, pigment grains." Much more might be written concerning the prevailing opinions in regard to the nature of malarial poison, but it would take us beyond the limits of this paper; suffice it to say, that the germ is almost in the bounds of the visible, and that it is a living pathogenic organism is certain. There are certain well known outward manifestations of its habitat within the system and which characterize the diseases of which it is the cause.

The primary pathological lesion when the malarial poison enters the system is in the blood itself, destruction of red globules, loss of saline constituents, the increase of coloring matter of serum and retention of coloring matter of bile. With an altered blood, primary functional disturbance will be produced in various organs, dependent on this alteration in supply of nutritive fluid; in fact, there will be marked perversion of physical, muscular and nervous force; secondarily, there are structural alterations in various organs. Without going into details, we will say that these structural changes do not differ materially from changes wrought by other morbid processes, but the distinguishing characteristic, that which gives malarial diseases a definite pathology, is the pigmentation and destruction of red blood globules, this being the result of the ravages of the malarial micro-organism. The outward manifestation of the existence of malarial poison in the system is, "Prevalence in certain sections at certain seasons, periodicity and regular succession of cold, hot and sweating stages."

With this digression, which was necessary to fully explain views expressed further on in regard to Malarial Hæmaturia, let us return to

the consideration of this disease. The disease, in its various forms, as met with in this locality, is accurately portrayed in the four typical cases recorded in preceding pages. The clinical features of nearly all these cases were similar, and it is evident they were cases of Malarial Hæmaturia. It is a reasonable assumption that the pathological changes were the same and corresponded in every respect with Case IV, in which a post-mortem examination was held and accurate observations of histological characters made. Granting the propriety of this assumption, we are prepared to discuss the course of Malarial Hæmaturia as derived from observations on these four cases, or not granting it, we take only one and base our opinions on that, mindful of the fact that a single investigation does not prove absolutely anything in scientific research, but it must be some evidence, however little, to be used in the induction system of reasoning by which scientific accuracy is attained.

From what has preceded in regard to the general character of malarial diseases and special characteristics of Malarial Hæmaturia, we are forced to one of the following conclusions as to primary cause, viz :

I. Malarial Hæmaturia is is not of malarial origin.

II. If of malarial origin, there exists in addition to malarial micro-organisms another of very different character and with different outward manifestation of its existence ; or

III. Malarial Hæmaturia is of malarial origin alone, and micro-organism seen in Case IV was the bacillus malariæ of Klebs, Crudeli, Marchiafava and others.

Little doubt can be entertained from investigations that have preceded, that conclusion I is erroneous, unless it is assumed that the baccillus observed in Case IV is primarily and solely the causative element of the disease, and by its life acts all the ravages of the disease are produced. While this may be so, we are not prepared to prove it. That conclusion II is true is decidedly more probable, that is, that besides the general pathological characteristics of malaria, the disease presents others not seen in normal malarial diseases, and if malaria exists at all as a causative element, there is another of entirely different nature. There is a decided preponderance of evidence in all preceding investigations in favor of malarlal origin. Its mode of onset, its occurrence in certain localities at certain seasons generally, and the results of study of pathological changes all point to the fact that malaria exerts some causative influence. My own investigation discloses some discrepancies in the deportment of Malarial Hæmaturia and what may be called normal malarial diseases. These discrepancies, as noted in cases occurring in this locality, are principally in lack of periodicity and that clock-like regularity in the rise and fall of temperature, and the season of the year in which it occurs, and the appearance of a peculiar microbe not seen in malarial diseases. Cases are met with in

all seasons, more often in the Fall, but in Summer and Winter as well, and in localities in which other malarial diseases are not prevalent to a great extent. When the disease once commences, as evidenced by jaundice, great depression, black urine and nausea, there is a continuance of these symptoms until convalescence or death ; no intermission or remission and return at stated intervals. After convalescence in exceptional cases, death occurs suddenly, without return of characteristic rigors. Either death results or convalescence commences in from two to ten days. In all my cases, a notable feature was low temperature and rapid, feeble pulse ; in cases of other physicians in this section I have heard of the temperature reaching 105° F. on first or second day, but after that there was the low temperature as in my cases. In no case has the temperature ranged higher than 102° F., and this was following reaction from the first chill. The low temperature is a symptom almost pathognomonic, and should be looked for as much so as dark urine and jaundice. There is never, in cases here, a regular or periodic variation in temperature. The alkaloids of cinchona fail to exert the slightest influence over the disease in a great many cases, even when given early and by mouth, rectum, endermically and hypodermically. From this it will be seen that discrepancies do exist, and these discrepancies being a constant accompaniment of Malarial Hæmaturia in this section, there must be a constant and common cause of different nature and different attributes to the malarial poison, at the same time we recognize in pathological changes and in some clinical features the characteristics of malaria. We are then forced to admit two elements of causation, viz: The malarial bacillus and another different from any yet found in malarial diseases, and to strongly suspect a characteristic micro-organism of the diserse. It is reasonable to ascribe the variations in the conduct of ordinary malarial diseases and Malarial Hæmaturia to the presence of this bacilus so like the Anthrax bacillus. It cannot be that its greater severity is due to a larger amount of poison taken into the system, for upon post-mortem examination in many cases, the characteristics of malaria are not so conspicuous as it is in mild forms of malarial fever, when death occurs from some intercurrent malady, the malarial infection itself not being sufficient to cause death.

The bacillus observed in liver and spleen differs in essential parts from that described by Lavaran or Klebs and Crudeli, and destroys at once the idea that it is the bacillus malariæ. That such a combination of causative agents exist as we maintain does in Malarial Hæmaturia, is further substantiated by the fact that in many hot climates, as Egypt, Mauritus and Cape of Good Hope. a disease is met with, having many of the characteristics of the one in question, in which is found a microbe, the bilharzia hæmatoba. The presence of this microbe is always accompanied by dark urine containing altered blood, or a

decided hemorrhage from the kidney. In malarial diseases in these countries, without the bilharzia, the kidney affection is not exhibited. It may be that the microbe observed in my case serves the same purpose here that the bilharzia does in those climates; the effect on the system is similar in many particulars. When the bacillus anthracis, to which the one observed in Malarial Hæmaturia seem so nearly allied, finds a habitat in the system, it produces many of the same symptoms as noted in the latter disease, such as vomiting, constipation, rigors, headache, extreme prostration, and usually speedy collapse. Temperature is usually very little elevaed, if at all; death occurs in forty-eight to sixty hours generally; it may be more rapid or delayed five or six days; no periodicity marks the disease. The only points of outward difference are the black urine and jaundice in Malarial Hæmaturia. It is reasonable to assume a certain relationship between the microbe of Malarial Hæmaturia and Anthrax, but they are not identical, and the deviations of the former from normal malarial diseases can be ascribed to the presence of this microbe, its effect being very much the same as the bilharzia in hot climates, although it differs from the bilharzia in outward appearance, as much as it does from malarial micro-organism as described by Lavaran and others. Future investigations, we think, will justify the conclusion that this bacillus is an essential element of causation of Malarial Hæmaturia, and that without its presence malarial diseases will exhibit the ordinary phenomena of Intermittents or Remittents, but with it, those of Malarial Hæmaturia. Our investigations prove this, but they are not sufficient to consider it an established scientific fact; all that we can hope to be accomplished by it is the direction of the attention of others to the results obtained, that the investigation may be further prosecuted.

As to treatment, I have very little that is new or original to offer, yet a few practical hints may be obtained from my experience. Our efforts should be directed to sustaining the rapidly failing vital force, and counteracting the effect of the poison, by cinchona alkaloids, the prevention, if possible, of suppression of urine, and the elimination of poison already in the blood.

In the beginning a brisk cathartic, either vegetable or mineral, should be administered; one preferable to any other is a combination of podophyllin, aloin and extract of belladonna, or calomel may be given alone or in combination with rhubarb. Great difficulty will be met with here in producing free catharsis on account of the irritable stomach and the rejection of all remedies administered for the purpose. If you can do no better, give enema containing castor oil and warm water. At the same time that efforts are directed toward moving the bowels, quinia in some form should be administered, and as the exces-

sive irritability of the stomach will prevent its administration by that way, it will not do to attempt it, but commence at once with other means; above all other methods, the hypodermic is to be preferred, and a solution of bi-sulphate or hydrobromate of quinia used by this method. It is a useless waste of time to wait and see if the stomach will not get quiet; commence at once the use of the hypodermic method, and to the aqueous solution of bi-sulphate it is advantageous to add a few minims of pure carbolic acid. Five grains of bi-sulphate should be thus given every three or four hours, until twenty-five or thirty grains are administered. If improvement takes place this is gradually diminished; if not, it should be continued. When it is not practicable to use the hypodermic method, quinia may be administered by rectum in suppositories or solution, or may be used by inunction; but no method is so reliable as the hypodermic. Careful alimentation is necessary but almost impossible on account of irritability of the stomach; here, too, hypodermics of beef, milk, cod-liver oil, etc., may be used to advantage, and likewise rectal alimentation practiced according to orthodox methods. To relieve the irritable stomach and introduce food and medicine by the natural channel would be a great advantage gained; sometimes this can be accomplished, but oftener it cannot. While not relying on the stomach, efforts should be directed toward relieving the agonizing nausea by application of sinapisms over epigastrium and internal administration of oxalate of cerium and bismuth sub-nitrate, and such other remedies as are generally used for such purposes; the remedy above all others to be relied upon to relieve the nausea is a solution of hydro-chlorate of cocaine; this sometimes acts like a charm, relieving at once the troublesome symptom, but like all other remedies, it sometimes fails; it should always be tried. It is well, however, even if the stomach does become retentive, to continue the administration of quinia hypodermically and burden the organ only with the necessary nourishment or stimulant; the latter it is necessary to use in all cases and use freely, but with judgment; iced champagne, milk punch and egg-nog are preferable. When it is possible to administer medicine by mouth digitalis infusion in one to two tablespoonsful dose is indicated for the double purpose of sustaining the weak heart and for its diuretic effect. It may be combided with aromatic spirits of ammonia or alkaline diuretics. The lumbar region should be rubbed repeatedly with spirits turpentine and every effort made to overcome the tendency on the part of the kidneys to strike work. No remedy is equal to twenty or thirty grains of calomel for this purpose. Morphia and atropia in combination should be administered as occasion requires to procure sleep and relieve pain, and the tendency to constipation overcome by continued administration of cathartics As soon as the urine clears up and convalescence is ushered in, a general tonic treatment should commence, continuing the admin-

istration of quinia in tonic doses for several weeks. After this such remedies are indicated as is usual in recovery from acute diseases and which it unnecessary to mention. I must call special attention to the use of cocaine in this disease. I have often seen it have the happiest effect in relieving nausea, stimulating the kidneys to increased activity and causing an increase in force of the heart's action. It has frequently happened that improvement commenced from the first dose of cocaine. It should be given in solution, using ten or fifteen minims of 4 per cent. solution, repeating every few hours until the desired effect is obtained.

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ILLUMINATING OILS.

By Prof. W. G. SIMMONS, of Wake Forest College, N. C.

Petroleum, or rock-oil, is widely distributed, occurring in all the geological formations from the Silurian to the tertiary rocks. It is associated with limestones, sandstones, and shales; and in some localities it rises to the earth's surface, and is to be seen floating on the neighboring streams and lakes. Sometimes it collects in deep-seated basins between impervious strata, ready to spout forth, like an Artesian well when pierced by the auger.

Though we can obtain petroleum by the distillation of pit-coal, yet its occurrence is by no means limited to the Carboniferous era. While rock-oil is found in the coal-measures of West Virginia and Ohio, the oil wells of New York and Pennsylvania are entirely outside of the coal-formation; and in California, the oil issues from shales which nowhere contain any coal.

Notwithstanding petroleum is widely diffused through the various geological formations, its geographical diffusion is also extensive, being abundantly found in the United States, Canada, the West Indies, Persia, Burmah, China, India, and perhaps in more than half the countries of Europe.

In Sicily, rock-oil was collected and burnt in lamps before the Christian era, and in Zante, there was a spring of it which, in the time of Herodotus, was used for embalming the dead.

Sometimes petroleum comes from a submarine origin. To the south of Vesuvius, a spring of it rises up through the sea. Likewise several springs issue from the Pacific ocean near the coast of California.

Rock-oil is usually associated with common salt, the salt-water being pumped up with the oil into a common receptacle in which the two liquids slowly separate—the lighter, oil, rising to the top and floating on the subjacent brine. The proportion of the oil to the salt is, indeed, very variable; but the general rule is, *no brine, no oil.* It is a proverb that oil and water will not mix; yet in nature's subterranean laboratory this rule seems to be utterly disregarded. The closeness of this relationship between the oil and the salt has never been satisfactorily accounted for.

The existence of petroleum near the head-waters of the Alleghany river, in Pennsylvania, was known, at an early day, to the European settlers of that region. The Indians collected it on the shores of Lake Seneca and sold it, as a medicine, under the name of Seneca Oil. A small tributary of the Alleghany was named Oil creek, from the oil exuding from its banks and floating on its waters. In the valley of this creek are numerous ancient excavations evidently made for the

purpose of obtaining the oil, but when made, or by whom, no one knows. Some have conjectured that these excavations are the work of the French occupants prior to the English conquest of the country in 1763; others believe that the Indians dug these pits—as it is well known that they set a high value on the oil, using it as a medicine and mixing their war paints with it. This is the more probable hypothesis; and there is little doubt that the red man here raised his war shout long before the pale-face raised his avaricious shout over the discovery of these mineral treasures.

A scientific journal published in 1826, speaking of the borings for salt in Ohio, says: "They have sunk two wells which are more than four hundred feet deep. One of them discharges vast quantities of petroleum, or, as it is commonly called, Seneca oil, and is subject to such explosions of gas that they make little or no salt. Nevertheless the oil affords considerable profit, and it is beginning to be in demand for lamps. It affords a clear, brisk light, and will be a valuable article for lighting the streets of the future cities of Ohio." At a somewhat later period a spring was struck near Pittsburg; but the product was valued only as a medicine, and was put up in small bottles and sold by retail at high prices. At the beginning of the present century a gallon of the oil sold for twenty dollars.

It thus appears that petroleum acquired considerable reputation as a medicine long before it was used for illuminating purposes; and there is no doubt that it has therapeutic virtues when used externally for rheumatism and chilblains; and when taken internally, it is expectorant, antispasmodic, and diaphoretic.

The crude rock-oil has been known for at least four thousand years to exist in various localities, but it was reserved for the nineteenth century to utilize this vast repository of light stored up by prehistoric sunshine acting on prehistoric organisms. It is only within the last thirty years that the collection of petroleum has developed into a gigantic industry.

Sometimes the oil when first reached by the auger spouts up and overflows from the well, escaping at the rate of several thousand gallons a day; but after a time the overflow ceases, and then the pump and steam-engine are brought into requisition. These spontaneous fountains are altogether ungovernable, pouring forth thousands of barrels of oil to run to waste, or perhaps, by some mischance, to take fire and produce disastrous conflagrations.

Various opinions have been advanced as to the genesis of rock-oil. Without doubt it has originated from the decomposition of organic materials. One authority maintains that it is the product of the destructive distillation of woody fibre by volcanic heat. Another regards it as resulting from the decay of certain highly resinous trees of a past

geological age. And another thinks that its origin is to be attributed to the decomposition of the lowest forms of marine life.

As found in the earth, petroleum is a mixture of several hydrocarbons differing widely from one another. Petroleums, accordingly, vary in quality, and wells sunk in close proximity often yield very different products. Some of these products are clear as crystal, others are slightly brown, while others still are greenish. They all have a pungent odor; and if they are to be used for illumination, they must all be refined at considerable expense and loss from the waste products. The process of refining and the loss from waste products will vary with the quality of the natural material—no two petroleums being exactly alike, all being mixtures of various hydrocarbons in variable proportions, and being, therefore, of indeterminate chemical composition.

Refining petroleum consists in separating its complex materials by distillation. The raw material is put into large iron stills and heated. At a moderate temperature inflammable vapors are given off. The removal of these inflammable substances is necessary to the safety of the oil; for, if allowed to remain in it, they would, at comparatively low temperature, form highly explosive mixtures with atmospheric air. These vapors, the first product of the distillation of petroleum, are likewise admixtures of several hydrocarbons of intermediate composition. They readily condense into inflammable liquids, such as rhigolene, gasolene, benzine, &c., some of which have been utilized; but the demand for these liquids in the arts is small, and there is, accordingly, a constant temptation held out to the refiners to leave them in the oil. They have a low specific gravity, low boiling point, and a high degree of combustibility. These liquids—rhigolene, gasolene, benzine, etc.—promptly mix with one another, and the name naptha has been given to the mixture.

After the naptha has been removed, the second product of the distillation of rock-oil is kerosene or *true illuminating oil.* It volatilizes at a moderate temperature, and its vapors, conducted from the still in iron tubes immersed in cold water, are easily condensed into a clear liquid. This liquid (kerosene) has a higher specific gravity than naptha, boils at a higher temperature, and is less inflammable; and for economy, and excellence of the light afforded by it, it is unequalled by any other illuminating material of ancient or modern times.

When the kerosene has been removed by distillation, there remains in the still a residue, called paraffine, which has a higher specific gravity and higher boiling point than kerosene, and is less combustible. If allowed to remain in the kerosene, this paraffine would impair its combustibility and depreciate the quality of its light.

The object to be attained in refining rock-oil is thus made apparent. The more volatile ingredients must first be removed by distillation, so

that they may not, at low temperature, give off vapors which, when mixed with air, would occasion dangerous explosions. These substances, called naptha, have a low boiling point, and are therefore the first products given off. But it is, likewise, necessary to remove from the oil those substances having a high boiling point, such as paraffine, vasaline and paraffine oils, as these would impair the combustibility of the oil, and gum and char the lamp wicks. The kerosene, having an intermediate boiling point and intermediate specific gravity, has, likewise, an intermediate combustibility, being less combustible than the naptha and more combustible than the paraffine. In fine, naptha and paraffine must both be separated from the kerosene, the former on account of its excessive, and the latter on account of its defective, combustibility.

The uses of naptha are few and the demand for it is small. Hence its price in the market is so low that it is not unfrequently thrown away by the refiners as a waste product. The paraffines likewise command a small price, and there is thus created a strong incentive to increase the qnantity of the more valuable constituent of rock-oil, to wit, kerosene, by the insufficient removal of the less valuable constituents, to wit, naptha and paraffine. It is true that the uses of naptha are multiplying in the arts, but still the demand for it is less than the supply, and millions of gallons of it are consumed at the stills as fuel, or burned up to get rid of it.

The lines separating the more inflammable and the less inflammable ingredients of rock-oils from the kerosene are somewhat arbitrary, and the refiners are constantly yielding to the temptation to leave in the kerosene an excess of naptha and paraffine. This excess of naptha makes the oil dangerous, while the excess of paraffine causes it to become opalescent and even to freeze in cold weather. Some inferior oils are so adulterated with paraffine that the barrels containing them must be warmed by the fire in cold weather before the contents can be drawn out.

Naptha of all grades is a fraud on all consumers of burning fluids, because it burns so rapidly as to be exceedingly expensive. There are professed refiners of kerosene whose businsss it is to separate the naptha from the kerosene, but who, from motives of cupidity alone, do not effect the separation which they profess to make. There are others who purchase the more costly kerosene and less costly naptha, and then mix these together, and sell the mixture as genuine kerosene. If the only result of this fraud was the rapidity with which the oil is consumed, the evil might be tolerated; but when we consider the terrible consequences resulting from the use of such oils, we cannot be expected to repress our indignation against the enormous iniquity of making and vending, under the name of kerosene, those napthas which are far more dangerous than gunpowder.

So numerous and fatal have been the accidents arising from the use of kerosene mixed with naptha, that in many countries stringent laws have been enacted prohibiting the manufacture and sale of these explosive mixtures. Several of the States of the American Union have such laws on their statute books. But notwithstanding such legislation, a great deal of bad oil is manufactured, sold, and burned every year; and as a legitimate result, many accidents occur, many lives are lost, and much property is destroyed.

As a simple mode of protecting one's self against dangerous oils, the writer extracts from a cyclopedia at hand the following: "Take an ordinary pint tin cup. Fill it within an inch of the top with water warmed to the temperature of 120° F. Pour on this water three or four tablespoonfulls of the oil to be tested. Stir the oil and water together, and wait a short time, say a minute or two, for the oil to collect on the top. Try the thermometer again, and if the temperature is more than one degree from 120° F., add a little cold or hot water, as the case may be, so as to bring the temperature to within one degree of 120° F. Then stir again and give time, as before, for the oil to come to the top. Now apply a burning match or lighted taper on a level with the top of the cup, say within half an inch of the oil. If within one second no flash occurs, the oil is reasonably safe; otherwise, it is unsafe. Purchase four or five gallons of oil at a time, and apply this test at each purchase."

As has already been said, many of the States of the American Union have enacted penal statutes in relation to the matter of vending unsafe oils. North Carolina has an unenviable distinction in this respect. She has never taken any steps towards protecting her citizens against dangerous oils. The writer has searched her statutes in vain for some protest, on her part, against the nefarious traffic in these explosive mixtures. The vendors of these explosives have found complete immunity in our State for their high crimes against humanity.

Oils that can be raised to 140° F. before giving off inflammable vapors may be burning in a lamp, the lamp may be broken, and only the ignited wick will continue to burn. But if the oil will flash below 100° F., the lamp, if broken, will be enveloped in flames, as likewise will all else with which the oil comes in contact. Many oils on sale in our State give off inflammable vapors below 100° F., and poor people will buy those of lowest grade to save from three to five cents on the gallon. The proper point at which to apply pressure is, not on those poverty and ignorance make some excuse for their conduct, but on the vendors who cannot plead ignorance or poverty. These should be compelled by law to sell only safe oils.

In 1875 Michigan enacted a law creating the office of State Inspector of Illuminating Oils. Prof. Kedzie says: "Before the enactment of the law, you could scarcely take up a newspaper without seeing cap-

tioned, 'Another Kerosene Horror.' Since the law went into operation scarcely a single accident has occurred from the use of kerosene in our State. The hand of the law touches every home in the State; and since it relates to the quality of a material which is in daily use in nineteen-twentieths of the homes of our State, it becomes a matter of vital importance to a larger number of our inhabitants than almost any law on our statute book. Nor does this importance extend only to the family using it. If any family in the village uses unsafe oils, the whole village is endangered. Chicago learned to her cost the lesson that the whole population had a vital interest in the kind of illuminating oil used by the humblest citizen."

After the great fire in Chicago some of the States began to adopt vigorous measures to check the manufacture and sale of dangerous oils. But different States adopted different tests, and the inferior articles began to be run out of the States requiring a higher standard into those having a lower standard, or no standard at all. As no test is required in our State, the best oils are sent to Michigan and New York where they can pass the test, while the poorest oils are sent to us, because we receive them without scrutiny, and because nobody else will have them.

We have sometimes seen powders hawked about like quack medicines and offered at high prices in the market, on account of the great powers claimed for them, by their vendors, in preventing kerosene explosions. These powders, on analysis, are found, for the most part, to be comman salt colored with red aniline. The directions for their use are to put a teaspoonful of the powder in a gallon of the oil, and shake well. In one case, the directions were to put a teaspoonful of the powders in the lamp, and this would act as a charm on all the oil that should ever be burnt in the lamp. As common salt is insoluble in naptha, it is superfluous to say that these powders are worse than useless, since their only effect is to render persons more reckless in purchasing and handling unsafe oils. If people would only reflect. they would know that if anything would make naptha safe, the refiners would use it at once, and thus realize large profits from the millions of gallons of this liquid which now runs to waste, or is consumed for fuel in running their stills.

It may be proper to append some extracts from the statute books of some of the States in relation to illuminating oils, showing what others have done, and suggesting, perhaps, what North Carolina ought to do in a matter so important to the lives and welfare of the people of the State.

Michigan—"Nor shall any person sell, or offer for sale, or knowingly use any coal or kerosene oil, or any of the products thereof, for illuminating purposes, which by reason of being adulterated, or for any other

reason, will emit a combustive vapor at a temperature less than 140° F., or which will not remain colorless and transparent when cooled for ten minutes to the temperature of 20° F."

Indiana—"It is hereby declared that oil or oils, to be lawfully sold in this State, after inspection, shall have a specific gravity of not less than .750, and not greater than .820; that said oils shall bear the gravity test of Beaume's hydrometer not below 46 degrees, nor higher than 50 degrees; that said oils shall bear the fire-test not below 140° F; that said oils shall bear the flash-test at not less than 120° F."

Illinois—"If the oils or fluids will not ignite or explode at a temperature less than 150° F., the inspector shall mark plainly and indelibly on each cask or package: 'Approved—Fire-Test being ——;' but if said oils or fluids will ignite at a temperature less than 150° F. as aforesaid, then the inspector shall mark on each cask, barrel or package: 'Condemned for Illuminating Purposes—Fire-Test being ——.' The inspector, while in office, shall not sell, bargain, or trade, directly or indirectly, in any of the said oils or fluids."

In conclusion, the writer will state that, with a view of ascertaining the general quality of the illuminating oils sold and consumed in our State, he obtained, from the various retail dealers within his reach, a number of samples of oils, and tested the same, and with the following results from the flash test, using a standardized Fahrenheit's thermometer: One sample flashed at 84°, two at 92°, one at 94, one at 95°, four at 99°, one at 111°, two at 112°, two at 113°, three at 114°, two at 115, two at 117°, two at 118°, and six respectively at 119°, 122°, 124°, 129° 129°, 131° and 144°. Total number of samples tested, 29.

By inspection of these numbers it will be seen that more than twenty-five per cent. of these oils flashed below 100° F. The corollary from these facts is that legislation is needed in our State to protect the lives, health and property of our people against the sale and use of dangerous illuminating oils.

ABDOMINAL SECTION FOR TRAUMATISM—INTESTINES SUTURED, WITH RECOVERY.

By Cornelius Kollock, A. M., M. D., Cheraw, S. C.

On the 19th day of December, 1886, Samuel Gaines, colored, aged 15 years and 7 months, was shot through the abdomen with a Smith & Wesson pistol—ball, 38 calibre—distance, six feet. At the time of the accident the patient was standing, and his comrade, from whose hands the pistol was discharged, was sitting on a low stool, at his left side. The ball entered the left inguinal region, a little above the sigmoid flexure of the colon, passed obliquely upwards, and emerged in the right umbilical region about one inch and a quarter from the median line.

I saw the case about six hours after the accident, when the following features were presented: The patient was very restless, had an anxious expression of countenance, much thirst and a weak pulse; also a deep-seated emphysematous crackling sound around the borders of the external opening. There was hepatic resonance, which though generally regarded as pathognomonic, is not an unerring sign, for it may be caused by the transverse colon being placed between the liver and the walls of the abdomen. A slight displacement of the liver might also give rise to resonance. The rectal temperature was decidedly subnormal. These signs, especially when considered with reference to the course of the ball, which had been explored with Nelaton's flexible spiral probe, clearly indicated intestinal perforation, at one or more points. Laparotomy was decided upon, and while preparations were being made for the operation, there was a movement of the bowels, and blood was passed per anum; small particles of fecal matter were observed escaping through one of the external openings. This settled the question of intestinal perforation beyond all cavil. The operation was performed under some difficulties, as is often the case in surgical practice out of town, where intelligent assistance cannot always be obtained. The patient resided on a plantation, remote from any settlement; the nearest physician being eight or nine miles distant, much time must elapse before his aid could be procured. The earlier an operation is done in a case like this, the better; every hour's delay adds to the danger of peritonitis and septicæmia. The peristaltic motion of the bowels was evidently recovering from the paralysis imparted by the shock, and blood and fecal matter was already being extravastated into the cavity. I therefore determined to proceed with such help as I had. One intelligent white man and two or three negroes constituted my corps of assistants. I administered the chloroform, and when anæsthesia was fully established, gave the towel to the white

man, with instructions to withhold when directed. The patient had been previously troubled with diarrhœa, had eaten nothing since dinner of the previous day, and very little then. This was in some respects an advantage, and in others a disadvantage. He was very gaunt, the abdominal walls were relaxed, and the bowels flat and flabby. This somewhat embarrassed the operation, but proved in the end a fortunate circumstance.

By an incision of three inches in the median line, below the umbilicus, the peritoneum was reached. The edges of the opening were thoroughly mopped with sponges wrung out of hot water before the peritoneum was opened; consequently very little blood, if any, escaped into the cavity. When that was reached, and the bowels were drawn out, every precaution was taken to prevent them from becoming chilled, by enveloping them in hot cloths. Search was then made along the track of the ball, and three intestinal openings were found. Two were in the descending colon, the ball having entered a little above the sigmoid flexure and passed through; a third opening was at the point where the ball emerged from the cavity, it having cut through a knuckle of the small bowel. An appendix epiploicæ which was found lacerated and bleeding freely, was tied with catgut at the base and cut off. The discharge of blood from a small vessel on the inner side of the colon was so free it was necessary to throw a small ligature around it. There was considerable oozing from a number of smaller vessels, which was readily checked by sponges dipped in hot water. The edges of the intestinal openings were now pared and drawn together by Lembert's suture—the stitches being placed only a line apart. Care was taken in putting in the stitches, to introduce the needle more than a quarter of an inch from the opening, causing it to penetrate to the submucous tissue, and then bring it out again about the eighth of an inch from the edge of the wound on the same side. On the opposite side, it was introduced about one-sixth of an inch from the opening and brought out a quarter of an inch from it. The advantage of this precaution is, that when the sutures were tightened, the mucous membrane was inverted, and the serous surfaces were brought in contact. Serous surfaces unite readily when brought in apposition, but no union can possibly be effected between two mucous surfaces, or between a mucous and a serous surface.

The peritoneal cavity contained a considerable amount of blood and fecal matter. The cavity was thoroughly mopped with hot sponges. The nozzle of a fountain syringe was introduced—the patient being turned a little to one side, and a steady stream of hot carbolized water kept up, till the water came out clear. All blood and fecal matter being removed from the cavity, the incision was closed by five white silk sutures, supported by adhesive strips, the whole enclosed in a gauze dressing and an elastic flannel bandage. The bowels were

kept locked by repeated doses of morphia for eight days, during which time not a particle of food was allowed, except occasionally a amall glass of fresh milk. The sutures were removed on the eighth day, when the parts were firmly united by the first intention. All dressing except the adhesive strips and flannel bandage was now removed, and the patient was allowed a light diet of peaches and milk and mush and milk for a few days, when he resumed his regular habits. On the morning of the ninth day there was a healthy natural action of the bowels, accompanied by no pain or inconvenience. The operation was in all respects very satisfactory. The patient recovered without a bad symptom, and is now, more than three months since the accident, perfectly well, and attends regularly to the duties of a farm hand.

Although the profession is now much interested in abdominal section for any purpose, more especially for traumatism and suturing the intestines, the literature on the subject is yet very meagre. Dr. T. S. K. Morton, of Philadelphia, in an able and interesting paper published in the "Medical News" of February 19th, furnishes considerable valuable information on the subject—more than can be found elsewhere. He also makes some excellent suggestions as to the manner of diagnosticating the existence of intra-peritoneal injury and as to the circumstances under which abdominal section would be proper. But Dr. Morton is not correct in all his statements. He says the first recorded case of gunshot wound treated by abdominal section is that of Dr. Kinloch, of North Carolina, in 1881, and that the first recovery is that of Kocher, of Switzerland, in 1883. Dr. Kinloch has always resided in Charleston, S. C., and not in North Carolina. His operation was done in 1862, on a soldier in the Confederate army. It was successful, and the patient lived a number of years afterwards. This case is reported in the "Medical and Surgical History of the War of the Rebellion."

With due respect to the Old North State and Switzerland, we cannot concede to either the initiation, or the first successful performance, of this important operation.

ANNUAL ADDRESS.

By J. W. Jones, M. D., of Tarborough, N. C., President of the Board of Health.

[Read before the Conjoint Session of the State Board of Health of North Carolina and the Medical Society]

On the 14th day of May, 1879, our Legislature, in the exercise of its protective functions, enacted public health laws creating State and local Boards of Health, with advisory and general supervision of the lives and health of the citizen, with an appropriation of $100.

On the 20th of March, 1885, our health laws were amended, with an additional appropriation of $2.150, making a total of $2,250 per annum, with a contingent fund of $2,000.

Under this amended act the State Board was reorganized. With little experience and inadequate means the officers entered upon their duties and have endeavored to carry out the provisions of the act creating the board.

They have organized 58 local Boards of Health, collected records of births, deaths, sickness, and the rainfall, temperature and winds.

They have also issued a Monthly Bulletin of Health, kept in communication with our local boards and the State boards of our sister States, and of the National Board of Health.

They have made reports on drinking water of Eastern North Carolina, illuminating oils, the preventable causes of diseases among females, the care of the eyes and ears, and the proper construction of school houses. We have inspected our jails and poor-houses, and upon invitation have visited our State Penitentiary, the camps of convicts employed on public work, the Deaf and Dumb Asylum, the Insane Asylum at Raleigh, and the Insane Asylum at Morganton; called attention to their defects and pointed out how they might be improved. It is hoped that the board has met the expectations of its friends and has merited the confidence of the State.

The sanitary condition of a community depends on the sound hygienic state of the external surroundings of life. A high death rate shows disorder and unnecessary waste of life; the nature and cause of which can only be known by a study of carefully-kept records of deaths, births and diseases. At present our general estimates must be comparative and based upon European records, those of our larger cities covering too short a period, and having not always been kept accurately. Thus far our boards have been unable to meet the difficulties in the collection of vital statistics. In the rural districts we have failed. In our cities and towns we have succeeded better. In this the

board is greatly embarrassed. Any reasonable expenditure of money in this direction would bring a great gain in life, health and property.

We submit that we have reached a point in our work which makes an increased appropriation an absolute necessity, that we may go on to better things and sufficient, that our Secretary may devote his entire time to this duty—going from county to county, organizing local boards, instructing health officers, collecting and tabulating statistics, visiting districts threatened with outbreaks of diseases and epidemics, inspecting our public buildings, poor-houses, jails and stockades, and by enlarging the circulation of our Bulletin disseminating information that will tend to promote health and prevent disease.

For this responsible position we must have an officer fitted by long experience and special training, with no other work to divide his time, nor should he expect removal so long as he is faithful and true to his work and obligations.

While sanitation is no new matter, sanitary science is of recent date, because based and dependent on the development of other sciences—Mathematics, Chemistry, Biology and Statistics. As these have been better understood it has had a larger place and been more generously treated. It is most worthy of them all, because it treats of that knowledge which tends directly to the preservation of health.

Our University, which is charged with the training of the minds of the young who are to lead in thought in the State, could do no nobler thing than to introduce a system of instruction which should raise sanitary science to that higher plane to which it is entitled; also for the dissemination of sanitary knowledge among the people, for the education of health officers, and for the solution of those problems which arise in the study of the origin and spread of disease.

The progress in the improvement of health, the diminution of sickness and the prolongation of life depends on the increase of human knowledge of the laws that govern human life, and the conditions best suited to its development. The length of life has varied in the same ratio. Before the flood the average length of life of the generations from Adam to Noah was seven to eight hundred years. So long, says Josephus, because they ate food fit for the prolongation of life, and were beloved of God.

After the flood, as man scattered over the earth, became ignorant, filthy, and forgot God, the average length of life gradually fell. In the days of the pest, in the dark ages, it went down to sixteen years. As learning revived and knowledge was disseminated among the people, and the result of the Reformation began to be accomplished, the death rate in ratio grew lower and the length of life increased, till in our own time, in Europe and North America, where sanitary laws have been observed, the average duration of life is about fifty years, and, as compared with the last century, doubled.

By the prevention of sickness the individual makes strength and saves time, to devote to the making of money and bread and for the development of his intellectual and moral parts, upon which the power and influence of the nations depend.

The sanitarian enabled the Roman legions to do the bidding of the Cæsars. The sanitary engineer made Rome a fit abode for heroes, poets and orators. All the sanitary provisions and measures which modern civilization has aimed at existed in germ in the ancient Hebrew literature of the Bible and Talmud, so rich in wisdom and knowledge on all questions of our civilization.

The Jewish religion and civil government were closely interwoven. The laws of the one and the penalties attached thereto were as sure and severe in the one as the other, both being prescribed in the name of the Eternal God. They extended to matters touching our most intimate relations of life—the ministration of political affairs, the proper food to be eaten, the propagation of the races, the spread of contagion, burial of the dead, hours of labor and rest, recognizing the important influence which health has on all conditions of social life and international intercourse, and that the basis of all development of the races depends on the moral, physical and intellectual training of the individual—the pleading thought being "cleanliness and godliness."

From a higher, spiritual standpoint we should protect life; because it represents something divine, immortal, and because health and sickness are attended by so much suffering and expense. Therefore the State should put the highest value on life and protect it at any cost, whenever endangered by any cause, be it from war, disease or pestilence.

Disease is a common enemy of our race, destroying the lives and taking away the time and property of our people. To meet it successfully and stay its ravages, it must be done by organized resistance on the part of the State, under the management of skilled leaders.

However much it may be revolting to human sentiment to meet the utilitarian demands of the age, we will from that cold standpoint briefly examine its cost and the losses it incurs.

The economical value of a citizen is variously estimated by English and American writers at from two or three thousand dollars, which is the estimated difference between what the citizen produces and what he costs his family, the community and the State for his living and education, dependent upon his age, sex, social position, employment and health, the aggregate sum total of which is the social invested capital of the State.

The loss of every life and every day's work, the training and education of the citizen during the unproductive period of life, is so much drawn from this estimated social capital. All the savings from any one of these is that much gain.

Let us refer briefly to the extent of the national income that is di-

minished by sickness. Since the period of the past, in the dark ages, the average duration of life has more than doubled. This prolongation of life, the experience of riper years, together with the inventive genius of the race, have made the old the better to see, hear and walk, thereby lessening beyond calculation the ills of life, and beyond measure adding to man's years, intelligence, wealth and power.

M. Berttilon, an eminent statistician of France, estimated in 1883 the typhoid mortality of twelve large European cities at 5.1 for each 10,000, viz: London, Paris, Berlin, St. Petersburg, Vienna, Glasgow, Brussels, Copenhagen, Edinburgh, Christianna and Madgeburg. Taking this as an average typhoid mortality for all Europe, with a population, in round numbers, of about 300,000,000, it has fifteen million cases of sickness and an annual mortuary loss of one million five hundred thousand deaths from typhoid fever.

Dr. John Simons, medical health officer of the Local Government Board of England, gives it as his well-established conviction, which is accepted as substantially correct by English writers, that in each year the deaths in England were fully 125,000 more than they would be if existing knowledge of the chief causes of disease as affecting the masses of the population were reasonably well applied.

Sir James Paget thinks, from the study of reliable data, that the annual loss of time by sickness for the entire English people is one-fortieth of the work done, or nine days in a year for each man, woman and child between the ages of sixteen and sixty-five years. This would be an annual loss of time by sickness for the whole kingdom of about 20,000 weeks. At $5.00 per week, an annual loss of $100,000,000, not counting cost of sickness.

This distinguished sanitarian further says that annually there are 23,000 cases of typhoid fever, with 4,000 deaths, in England and Wales, from this disease. Estimating the sickness at ten weeks' duration, we have an annual loss of 230,000 weeks' work, not counting the loss by death, from this disease alone.

Let us now make some inquiries as to the cost of sickness and death as it affects the financial condition of our own country. Our estimates can only be comparative, and the study of one disease must serve our purpose to-day. We select typhoid fever because it is common to all countries, because of the heavy mortuary tax it lays, its known nature, its decrease and disappearance as pure water is supplied and excreta and filth are removed. Consequently, the loss which it represents can be almost entirely prevented, as has been done in many other preventable diseases, viz: by proper sanitary measures.

In our estimates we shall consider the duration of each case of sickness at thirty days, the cost of nursing at one dollar a day, the cost of medical attention and medicine at three dollars a day, the loss of wages at one dollar a day, the loss by death of a citizen at two thousand

dollars, and his burial expenses fifteen dollars, making the loss of one case of typhoid fever one hundred and fifty dollars, and in case of death, the loss of the citizen and burial expenses two thousand and fifteen dollars, making the sum total for sickness and death twenty-one hundred and sixty-five dollars.

We find the average mortality of the United States to be about the same as that of Europe—five deaths to each ten thousand people annually. Assuming that the population of the United States has been fifty millions for the last ten years, it has loss by death annually two hundred and fifty thousand of its citizens, and if ten recovers to each death, and two million five hundred thousand cases of sickness—making the money loss from typhoid fever alone $4,000,000,000.

In consideration of the accredited healthiness of North Carolina, and to relieve ourselves of any risk of overestimate, instead of the European death rate from typhoid fever of five to each 10,000, we shall assume one-half that rate, $\frac{5}{2}$, to each 10,000 for our State, which has a population of one and a half million.

At one-half the European mortuary estimate, she loses by death annually 7,500 of her citizens, with 75,000 cases of sickness, at a cost of $8,000,000 for the deaths and $5,000,000 for sickness, making a sum total of annual loss from typhoid fever in money value to the State of about $13,000,000.

Edgecombe county, with a population of 26,000, has an annual death loss from this fever of 65 of her citizens, with 650 cases of sickness, making the sum total of loss by death and sickness from this disease, in round numbers, about $100,000 annually.

Wake county, with a population of 48,000, loses annually by this disease 120 of her citizens, with 1,200 cases of sickness, the sum total of her losses by deaths and sickness being about $200,000.

Mecklenburg county, with a population of 34,000, has an annual death loss of about 85, with 850 cases of sickness, making the sum total of loss from this disease in money value of about $145,000.

Dr. Billings, in reference to the entire United States, says: "It can be shown that the direct pecuniary loss to the country on account of preventable sickness and mortality is certainly over $100,000,000 annually, and this without taking account of expenditures incurred on account of sickness, or the usual loss due to great epidemics, both from waste of life and injury to commerce."

This makes North Carolina lose, from sickness and mortality, with a population of one and a half millions, annually three millions of dollars, or two dollars to each citizen. Edgecombe county, with a popnlation of 26,000, $52,000; Wake county, with a population of 48,000, $96,000; Mecklenburg county, with a population of 36,000, $73,000.

Dr. Joseph Jones, in his recently published statistics, based upon the

records of charity hospitals in New Orleans, says that we may affirm that nearly one-half of the deaths in New Orleans during the last thirty-four years (118,095) were caused by preventable diseases, the remedy for and the diminution of same being effective drainage. From this disease New Orleans has lost in thirty-four years, according to reliable data, $118,094,000.

The mortuary loss of North Carolina by typhoid fever annually is sufficient to populate a city of the dead as nearly as large as your beautiful city of the living, many of whom to-day, instead of sleeping in their graves, should be living, loving, acting—fathers, mothers and children.

Even moderately well applied laws of hygene, together with Christian control of the passions and appetites, and the prevention of preventable diseases, would do more to increase our population and develope our resources than any emigration bureau or industrial association. The greater part of the national wealth is the income from the work which is the outcome of the natural health, says Sir James Paget.

REPORT OF OBITUARY COMMITTEE APPOINTED BY THE PRESIDENT IN ACCORDANCE WITH RESOLUTION ADOPTED AT FIRST DAY'S SESSION OF THE CONVENTION.

The Committee appointed to present to this meeting of the Society obituary notices of those members whose deaths had not been reported by the Committees appointed at the Annual Sessions, since 1881, in submitting the annexed memorials, feel that it is due to themselves to say that the time for preparing this report has been limited. While it falls short of expressing the full, grateful recollection of these men whose many excellencies we have admired and might probably have taken as exemplars, it performs, however imperfectly, a duty that has long been neglected.

HANSON F. MURPHY died January 31st, 1882, in the 69th year of his age.

DR. MURPHY belonged to that sturdy class of self reliant physicians so well suited to hard work in an agricultural community, impatient of the servile following of the most gifted masters of medical science, relying rather upon thier trained powers of observation than the inflexible rule of the art as taught in the books. He was therefore seldom at a loss in the emergencies, and his resources were many times original. In the multifarious work which fell to his lot, he vigorously strove to fulfill the measure of his duty, and died greatly lamented by the community in which he lived.

JOSHUA C. WALKER, died on the 22d of December, 1882, at the age of 49 years.

One of his co-laborers of the profession in Wilmington said of him: His was a peculiar mind leaning always to the practical side of his profession and able to grasp in the maze of theories, facts to use at the bedside. In emergencies he was self-possessed, in experience he was well armed and in all professional matter conservative.

In the practice of surgery he had the tender gentleness of a woman, with the quick eye and resolute hand of an expert.

In days of peril, on the field of battle, he was useful, unselfish, untiring and courageous. His friendships were ardent and lasting. In all the years of his life, he exemplified that gentle courteousness which was but the natural expression of his refined manhood. The poor who came under his care will remember with what delicate generosity he dispensed comforts to them, beyond the official routine, and how assiduously he labored far beyond his physical capacity in his attention to them. He lived to gain the confidence of all who knew him, and died to be mourned by his many friends.

Dr. M. A. Wilcox for many years a useful practitioner of medicine in the County of Halifax, died at his home quietly and peacefully, March 30th, 1883, at the advanced age of 86. Peculiarly gifted with the attributes which constitute a gentlemanly manhood coupled with an indomitable spirit of energetic perseverance, he filled a position of high honor in the community of which he was a member. In early life Dr. Wilcox left the field of active practice for the more exciting life of a politician and was elected to the Legislature from Nash County, of which county he had become a resident only two years before, in 1825. His political career was cut short however by his return to the county of his nativity in 1826, where he remained in the active and successfu practice of his profession up to the time of his death.

Dr Wilcox enjoyed the perfect confidence of his professional confreres, and was for a long time the President of the County Medical Society. His memory remains with the people of his community intimately associated with the highest integrity of character and his professional record they point to with a just pride.

The death of Dr. Henry Watson Betts at Mt. Pleasant, to which place he had removed just previous to his demise, from the field of his practice at Albemarle, N. C., occurred April 11th, 1883. Dr. Betts was born in 1856, read medicine for 15 months under Dr. Paul A. Barringer, and was graduated from the University of New York in 1878. He applied for license in 1881 and passing a successful examination he was admitted upon application to membership in the North Carolina Medical Society the same year.

Courteous in demeanor, of sterling worth and extraordinary professional ability he enjoyed to a marked degree the esteem of his medical associates and the confidence of his patrons. His ultimately death cut short a career of promise, robbing the Society, of which he was an energetic member, of a record of usefulness and honor.

A venerable and honored member of the North Carolina Medical Society was lost to its ranks in the death of DR. HUGH KELLY, which event occurred at his home in Statesville Sept. 1st, 1883. The cause of his death was paralysis, which had incapacitated him from the active practice of his profession for four years previous to his death. DR. KELLY was born in Moore County, N. C., July 15th, 1815, and he had attained 68 years of age. He studied medicine at the University of New York in 1844 and 1845, receiving the Honorary Degree from that institution some years later. He became a member of the North Carolina Medical Society in 1849 and took an active but modest part in its deliberations thenceforth. DR. KELLY was not gifted with that fluency of thought and language which constitutes a ready speaker, but his vast fund of clinical experience made practically useful by careful observation and thoughtful consideration placed at his disposal a vast store of valuable information. His merits were deservedly recognized by the Society in his election to the Presidency in 1870. An energetic worker, actively engaged in a large practice for many years, showing in all his relations both as citizen and physician the many virtues which constitute a Christian gentleman, he met in life with the highest esteem and respect from all with whom he came in contact and his death leaves a justly revered memory.

The year 1883 seems to have been characterized by a peculiar mortality with reference to the Medical Society of the State. The death of DR. JAMES R. STATON of Tarborough, which occurred Dec. 23rd, of that year, added another to the list of those "gone before." DR. STATON was quite a young man—26 years of age at the time of his death—but the high esteem in which he was held by his professional confreres leads to the natural inference that his career had he been spared would have proven one of exceptional usefulness and honor. His untimely end was the more to be regretted in consequence.

DAVID T. TAYLOE, died in Washington, N. C., Nov. 25th, 1884, in the 58th year of his age.

DR. TAYLOE was a physician of the type which is the pride of our profession and an honor to the science of medicine. His intellectual culture was not inferior to his medical culture and this was of the highest order. He was more than a physician in the literal sense. He was a man of refined tastes and an accomplished classical scholar. While he ever kept himself well abreast of the scientific and practical literature, he was in every sense a well informed man. In a social

point of view he had few peers and no superiors. Generosity, courage and tenderness were strongly developed in his character. He could battle without bitterness, and if he inflicted a wound, it left no sting. It is seldom the death of a physician is felt so generally as a matter of public regret.

In Salisbury on January 2nd, 1885, DR. MARCELLUS WHITEHEAD died, having almost attained the age of 64 years.

DR. WHITEHEAD was born in Nelson County, Va. He began the study of medicine in the office of Dr. Warren Jones, a prominent physician of that locality, and afterward graduated from the Medical College in Richmond. He found his way to Salisbury in June, 1845, and from his skill and industry he early secured the confidence and support of the people of that town and vicinity. His whole life was spent in Salisbury and it is safe to say that there was never a man more beloved in the community in which he lived than he.

Those members of the profession who knew him personally will always recall his image with affection and high appreciation, and the new generation of physicians now coming on the stage can have no better model by which to shape their conduct in their grand calling, than is afforded them by the career of DR. MARCELLUS WHITEHEAD.

DR. JAMES KING HALL was born in Iredell Co., N. C., January 13th, 1816, and died at his residence in Greensboro November 13th, 1885.

He studied medicine with Dr. Burgess Beall, of Davidson County, and attended lectures at the University of Pennsylvania during the winters of 1847 and 1848.

Returning home he practiced medicine in Davidson and Iredell Counties until 1858, when he removed to Greensboro, and at once entered upon a large practice there.

In 1861 he entered the Southern army and was made Surgeon of the 22nd Regiment N. C. troops, which position he held for one year when he resigned and returned to Greensloro, where he remained in active practice until about two months before his death.

In 1882 he was honored with the Presidency of the State Medical Society and presided at the meeting in Tarboro.

As a physician DR. HALL was cautious and conservative but kept well posted in the progress of his profession, and his large experience, and strong powers of observation made him eminently successful in practice.

Frank and generous in disposition, gentle as a woman in the sick

room, he gained and held the esteem and affection of his patients as few men can do; while his many good qualities of head and heart gained for him the respect and good will of all who knew him.

He had been a member of the Presbyterian Church for many years, and died with a firm reliance upon the promises and power of the Great Physician to heal all who come to Him.

PLEASANT P. PEACE died at his home in Wake County, on 25th of January, 1886, at the age of 60. DR. PEACE enjoyed the confidence of a large circle of friends and acquaintances, whom he served well in every capacity to which their love and admiration called him.

DR. SAMUEL B. FLOWERS died on 6th of June, 1886, having nearly completed his 60th year.

A man of rare attainments, endowed with a fine mind, quick perception, good memory and sound judgment, he was, as would be expected, a successful physician.

His energy was unbounded, ready at all times he was a willing servant, always of the large clientele whose confidence he enjoyed.

The community in which he lived have recognized the loss sustained his death, for he served them as friend and adviser as well as trusted physician.

Died, on January 20th, 1887, DR. JOSEPH HOLLINGSWORTH, at his home, in Mt. Airy, Stokes County, in the 67th year of his age. He served one term in the State Legislature and declined reelection. We beg leave to offer our sympathy and condolence to his family and friends.

DR. JAMES A. MACRAE, one of the oldest members of the Society, died at his home in Fayetteville, 11th day of March, 1887.

Although the greater portion of his life was spent in the inobtrusive practice of his profession in the community in which he lived, he was well known all over the State. His nature was kindly and his charity large. Full of generous impulse, he always lent a willing hand to help the suffering, and to aid those who were struggling to succeed. His memory is endeared to his many friends by the pleasant recollections of his excellent traits of character.

By an oversight an error was made in the paging from this page on. The following page should be 161.

ANTIPYRIN IN CROUP.

By W. J. H. Bellamy, M. D., Wilmington, N. C.

In addition to the important therapeutic uses of antipyrin, such as an antipyretic in fever, or as a tranquilizing agent in cephalalgia in the phethoric individual, I wish to record some clinical facts to prove its efficacy and curative power in spasmodic croup, but time will not permit me to record but two of quite a large number of cases in which the remedy has been used:

Case I.—M. J., æt 5 years, subject to frequent attacks of spasmodic croup, with a family predisposition to same, attacks coming on generally at midnight and lasting for several successive nights, was again taken October 8th, 1886. Previous attacks having been unsatisfactorily treated with anti-spasmodics, nauseants, &c., antipyrin on this occasion was prescribed in eight grain doses, and produced in a few minutes a positive amelioration of the symptoms, and in less than one hour the little patient was sleeping quietly and breathing tranquilly—the surface of the body moist and cool. In this case there was no return of positive symptoms of croup.

Case II.—E B., æt 2 years, troubled often with spasmodic croup, and lasting as in Case I, for several days and nights—was taken on November 3d, 1886, with urgent symptoms. Antipyrin in four grain doses quickly quieted the child and relieved all urgent symptoms effectively.

The *febrifuge* and *soporific effects of quinia (alkaloid)* with *oleic acid* and *ol. theobroma*, in form of *rectal suppositories:*

Case I.—W. T., æt 10 months, with chronic chills and fevers, slight enlargement of spleen, irritable stomach, and decidedly anæmic; was unable to retain quinine upon the stomach, and received no benefit from oleate of quinia by inunction. Quinia, gr. j; oleic acid, gtt. j, with ol. theobroma, grs. v, was used in form of suppositories in rectum, twice daily, with the effect of controlling the chills and fevers, and at the same time to the annoyance of the parents, he slept quietly much of the time. Oleate of quinia was used by inunction at the same time. Iodine, ether and croton oil was applied topically over the region of the spleen, and one drop doses of the syrup ferr. iodid. was administered per orem ter die.

Case II.—Lizzie M., æt 6 years, suffering from continued fever, with some gastro-enteric disturbance; painful and wakeful; was treated by rectal suppositories as in first case—the first suppository being introduced when the child was fretting and painful, and the mother fearful

that she would spend a miserable night. The patient spent a good night, and the mother anxiously watched over her, fearing the effect of the remedy was too profound.

CASE III.—Morphia Habitue—Two grs. of quinia (alkaloid), with gtts ij acid oleic, ol. theobromæ, grs. xv, quieted patient on several successive occasions and put off the evil hour for the hypodermatic of Magendie's solution for an increased length of time. Failure to resort to it always called for the earlier use of morphia—with wakefulness, restlessness and the ordinary concomitant troubles.

The soporific property of quinia sulphate was years ago demonstrated by the renowned Manson, whose monograph will ever be a valuable legacy to the profession.

QUININE AMBLYOPIA.

By C. M. Poole, M. D., Salisbury, N. C.

On September 27th, I was called to see a lady, 38 years of age, who had an attack of malarial fever. I prescribed ten grains of calomel to be taken in the morning, and ten grains of quinine, to be taken five grains at 4 A. M. and balance at 8 A. M. The quinine was repeated the next day, when the fever was arrested and quinine discontinued. On the following day she was able to be up, but noticed that vision was somewhat blurred, which remained about the same during the day. On the following morning vision was more impaired, and at noon her husband determined to consult me. She was able to distinguish objects when she left home, but on arriving at my office was totally blind. She was taken into a dark room and a lighted lamp placed on a table. She was asked to turn around and point out the light, but could not realize that there was a light in the room. Examined with the ophthalmoscope no structural change could be detected. Iron and nux vomica were prescribed and it was a fortnight before there was any perceptible improvement. From this time on there was gradual improvement, with the exception of a few days at one time when she was again attacked with malarial fever, quinine was prescribed and these alarming symptoms at once began to be manifested. On discontinuing the quinine vision at once began to improve and in a few weeks she was able to thread a needle and do any kind of ordinary work, but her vision is not perfect.

I have had several similar cases, but vision was not totally lost in any but the above case.

Amblyopia is improvement on total loss of vision due to defective innervation or to a loss of nervous sensibility. Loss of nervous sensibility is most frequently caused by disuse of the eye. This is seen in strabismus, for with the opththalmoscope no structural change can be detected. Amblyopia may also be a result of immoderate drinking and debauchery, causing anæsthesia of the retina and thus rendering it dull and unimpressible.

The principal clinical facts of quinine amblyopia, briefly stated, are sudden loss of vision, and in most cases simultaneously with more or less deafness, after administration of large doses of quinine. The field of vision is permanently damaged in nearly all cases, and while central vision is again established, it seldom becomes normal. The ophthalmoscope shows extreme pallor of the optic disc and fundus oculi. The trouble is due therefore to extreme anæmia of the fundus oculi and the permanent damage is due to partial atrophy of the optic nerve.

Why and how quinine should have this effect is somewhat perplexing, but since small doses of morphine will cause an afflux of blood to the brain, or hyperæmia, and large doses will cause anæmia, it is reasonable to suppose that quinine *may* affect the optic nerve in a similar manner.

The fact that the trouble supervened after but ten grains of quinine had been given might perhaps cause some doubt as to the diagnosis, but when it is remembered that after a time a similar dose was given with like effect, there can be no doubt in this respect.

Quinine amblyopia is comparatively rare. Dr. Greening, of New York, reported a case in the "Archives of Ophthalmology," in 1881, and in searching the whole literature could find but eleven cases reported prior to his own case.

Dr. Michel, of St. Louis, adds one case. Dr. Young, our fellow-member, one, and Dr. Knapp adds three more. There perhaps have been others reported, but I have not been able to find them.

DRINKING WATER IN ITS RELATIONS TO HEALTH AND DISEASE.

By S. S. Satchwell, M. D., Rocky Point, N. C.

Mr. President and Fellow-Members:

The Board has struck an important key-note of sanitary progress in the more recent investigations it is making of the drinking water of the State in its relations to health and disease. The request of its able President that I should here and now report upon the drinking water of Eastern North Carolina so arouses my sympathy with the general work of the Board that a sense of duty will not allow me to decline. It is the duty of us all to contribute our mite at all times to the public health. As legitimate guardians of the health and lives of the people the obligation is common to us all not alone to cure all diseases that are curable, but to consecrate our energies also to the prevention of disease and to the removal of all removable causes of the various ills, mental and physical, that afflict the human family. This humane and noble work of preventing as well as curing disease imposes, in the demands of modern progress, high duties and grave responsibilities upon the medical man, and opens up to him constantly widening fields of labor and usefulness. It also teaches us, as the ennobling spirit of medical science, to be content "to do that which lieth nearest at hand," and to strive for character rather than for reputation and that unstable applause of the changing multitude which constitues a besetting sin of public men in these days of consuming selfishness and unholy ambition.

It has become a truism, a self-evident truth, that air and water are the great carriers of disease, although the people are not yet wholly awake to its importance. Authorities and instances without number can be adduced to prove that the impurities of air and water are the cause of nearly all the untimely deaths that are not the result of accident, individual imprudence or transgression. It is the opinion of most sanitarians that drinking water is a common carrier of contagious diseases and other affections, and that it is a vehicle of those scourges of mankind, Asiatic cholera and typhoid fever. Much of the sickness of our eastern counties, towns and cities is owing to bad drinking water. Many of our chronic diseases, such as indigestion, dyspepsia, nervous affections, renal troubles and bowel complaints can be largely traceable to contaminated drinking water. In the opinion of some of our ablest medical men impure drinking water is one of the producing causes of Bright's disease. It surely tends to disorder the kidneys

and bladder as well as the liver, and to lead to those disturbances of the vital functions of assimilation and nutrition upon which health and life depends. Comparatively few of our people have a just conception of the extent to which our drinking water is polluted. In the State of Massachusetts alone 393,000 cases of typhoid fever, with 40,000 deaths, have been traced to specific contamination of drinking water. If the truth, in this respect, of our own State could be told, the picture would doubtless be in proportion just as dark and sad. The extensive prevalence and increase of renal diseases in this State, including that terror of the people, Bright's disease, is ascribed in a great degree, by physicians of expecience, to the sediment of our drinking water which these filterers of the body, the kidneys, fail to eliminate from the system. Hence the obstruction and consequent degeneration of these organs that follow. It has been illustrated in the history of malignant epidemics in this country, in the last few years, that the poison of typhoid fever has been carried twenty-five miles and upwards in the water of running streams, and so communicated to others as to depopulate families and communities by the drinking of the same water. It has not escaped observation that unwholesome water is sometimes drank for a long time with apparent impunity. But in some unexpected hour, either from some change in the water by some unknown process of fermentation, or because of the introduction of some specfic contamination, devastating typhoid or bowel disease results. That illustrious sanitarian, Simon, remarks that the effect of impure water is not, in general, sudden or violent, but on the contrary is usually gradual, though not on this account the less real and severe. This slow and cumulative effect is one cause of the traditional public supineness in North Carolina upon the neglected subject of drinking water. Diseases resulting from the use of water of wells and springs, contaminated by accumulated impurities soaking into them through unhealthy surface soil, and from cess-pools, stables, hog-pens, privies, etc., have been too long regarded by many of our people as inevitable and unavoidable. Violent diseases and local epidemics were formerly regarded, and in some dark places now claimed, as inscrutable mysteries and dispensations of Providence. Now they are clearly shown to arise from the ignorance, mistakes and perverseness of man in violating health laws, especially in breathing unwholesome air and drinking impure water. Advances in sanitary science have taught us to know that whenever any violent or malignant disease or high fever suddenly falls upon a family or community, one may look for its cause, if not of foreign introduction, to some contamination of the elements of life, especially air or water, or both. The fact that it eludes discovery is no evidence that it does not exist. The most destructive causes are often the most invisible, especially to the naked eye. The inference from all

this is that diseases, epidemics, and even plagues, may occur at all times and places and alone from the secret contamination of the air and the drinking water. Far be it from my desire to awaken needless anxiety in any mind in relation to the dangers of our sources of water supply. In this State the problem increases in interest year by year, not alone where our villages, towns and cities are constantly increasing in size and importance, but in all progressive communities. To keep drinking water pure is a part of that system of cleanliness which constitutes an integral part of advancing civilization. Pure thoughts and noble aspirations find no congenial home where unclean air and water and filth of body and of houses and other surroundings abound. Old Testament history even declares this truth. The immense aqueducts of imperial Rome were used not alone to furnish the citizens with an abundance of good water for drinking and cooking purposes, but also to enable them to enjoy the cleanliness and luxurious pleasures of frequent bathing. It is true that in those early days sanitary science had not advanced to the point it has now reached of being able to detect those subtle influences and obscure causes of disease so often polluting the air we breathe and the water we drink. Chemistry and microscopy, in their rapid strides, are now enabling not alone the medical man and sanitarian, but the layman too, to understand how it is that rainfall and drainage, sinking into wells through the ground, and surface sewage and sewage from cess-pools, stables, privies, and other accumulations of filth upon premises and yards, emptying their impurities and contaminations into wells, springs and badly constructed cisterns, make the water-supply from such sources unwholesome and dangerous. Duties, constant and pressing, devolve upon this State Board and its auxiliaries in teaching the people that increasing impurities, attendant upon the increase and growth of villages, factories, towns and cities of our State, with the increase of houses and population in the townships of the various counties, endanger in like proportion the water-supply liable to such imperfections. And here it may be well to repeat a fact familiar to every intelligent physician, but which needs to be enforced upon the popular mind, that malarial fever as well as typhoid fever lurks in a large number of our wells and springs, especially in eastern counties. We all know that the poison of typhoid fever is one of those dangerous, invisible essences often found in well water derived in areas that have long been settled and where the surroundings are imperfect drainage, foul soil and unhealthy deposits. This statement may be supplemented by the fact that wells and springs of malarious localities absorb malaria from the surrounding atmosphere and that individuals drinking the water are liable to malarial infection. The water from the wells and springs of all such localities, especially when it comes from the surface, is always of

doubtful quality. The spread as well as the origin of typhoid fever has been time and again traced to the use of water from wells containing typhoid infection. But not until recent years has the doctrine of the propagation of malarial disease by means of drinking water met with that general acceptance in the profession now conceded by the most experienced physicians of malarious localities. Whether the water of wells of these miasmatic places absorbs the poison from the air or whether it becomes impregnated with malaria more directly from the soil, or from both sources, is not important in a practical view. But the theory of the water absorption of malaria as well as of typhoid poison, seems to rest upon as solid a basis as that which supports the doctrine of malarial absorption by the lungs from the breathing of malarial atmosphere. I have known families, living in malarious localities but drinking water the year round that was obtained from wells located at a distance where malaria was unknown, to escape malarial fevers so long as they drank the water. But in precisely the same locality, and living side by side with those exempted families, I have known other families, drinking the water upon their own premises, to be attacked season after season with intermittent and remittent fevers. It is of record that crews of ships, embarking from places and relying only upon marsh water to drink after leaving, have been prostrated with these fevers in face of the fact that they had not been exposed to any malarial infection from the atmosphere; while other crews of ships, leaving the same places at the same time, but supplied with water from sources free from malaria, escaped these fevers entirely.

And now I hasten on to the more specific purpose of my appointment—to report upon the drinking water of the eastern counties of the State, its sources, impurities, modes of purification, etc. To say nothing of the supply of such of our cities as have aqueducts, there are three sources of water-supply to our eastern counties, viz: wells, springs and cisterns. The water of wells is by far most generally used. The water of springs is extensively used, especially in the more hilly regions. But cisterns, under the new departure of sanitary improvement inaugurated by our State Board, are numerously springing up in a large number of the counties, to the evident great benefit of the public health. The truth compels us to state, with regret and sorrow, that a majority of the wells of the east are located in unhealthy spots and surroundings. They are exposed to soil contaminations and impurities that enter into them and pollute the water. Very many of them, instead of being located upon the higher spots of hills and ridges to be found upon most premises even in our eastern plains, and thus more exempt from surface impurities, are so situated and so shallow that they are easy receptacles of surface sewage and sewage of accumulations of

decomposing and filthy substances, including the sewage of stables, barn and fowl yards, privies, etc. To say, then, that much of the drinking water of the east is poisoned is to utter the voice of truth and experience. Our eastern plains largely constitute our eastern territory, and the greatest portion is imperfectly drained. A large proportion of the wells furnish impure water because they are shallow and easily receive surface impurities, especially as much of the soil is porous. Comparatively few of these shallow wells have curbs and a majority of our deep wells are destitute of them. No better illustration can be made of the lamentable ignorance, indifference and indolence of our people than to make this painful statement of the deplorable negligence of so many of them upon the vital question of their water-supply. No small portion of them obtain it not alone from these shallow and unprotected wells, thus contaminated, but are often content to get their drinking water from holes dug just below the surface. To say then that a large portion of the citizens of the State obtain their water-supply from wells and springs that are contaminated and are depositories of filth and literally manufactories of disease and death, is to utter a truth that should constitute a solemn appeal to the medical men and sanitarians of North Carolina to come to the rescue in a renewed crusade for reform in our water-supply. The suicidal neglect generally of our negro population in this and other important relations of health shows that they, as a general rule, are as unable to properly care for themselves individually as that inferior race are as evidently incompetent, in a higher sense, of self-government. And yet the resources in all our eastern territory are generally so abundant and easy of application for obtaining good water in the way of wells and cisterns, that if we can only educate the people up to its importance—give them a will and a disposition in this vital line, the way is clear, open and inviting. Induce them to dig their wells deep from elevated points and to rest upon healthy basis of soil for bottoms, so that good water will enter from below and not from above, and the desired result is reached. Teach them that unless their wells are cleaned out at least annually by the entrance of a man to the bottom to remove the unhealthy accumulations that are always getting there from the surface in the shape of trash, foul soil, and other impurities of yards, the water is unsuitable and sometimes productive of disease. These suggestions are especially needed in reference to the wells of old communities and long occupied premises, when these impure accumulations are greater and more dangerous. The water of wells of fresh clearings and new premises is better because time has not been had for the contaminating influences that are so commonly a part and parcel of old dwellings and old habitations of families. Important it is that wells should be covered in order the better to avoid the entrance of trash, unhealthy elements from the soil, and atmospheric impurities that

sometimes attend rain as it descends in certain electrical conditions. The same protection should of course be given to cisterns and springs. The unhealthy condition of the badly kept yards of most of the families of the east renders the water of the wells located therein impure, although when the wells are just opened and free, as new premises generally are, of surface impurities, and dug deep where the bottom is good, the water is apt to be good and as healthy as mountain water. Good drinking water in the east is more generally found in that belt of country where the rocky ledge and level lands divide, about on a line from Fayetteville to Weldon. East of this belt the surface impurities and malarial influences are more abundant and the water in general not so good, except in well-constructed cisterns and deep wells upon a healthy bottom. The wells of lower grounds, as well as springs, are more affected by the impurities of surface water than higher lands, and hence it is that residents of these lower grounds are more and more substituting cisterns for wells. It is well to remark that in some of our eastern counties chalybeate water abounds. Some of these springs are efficacious in dyspepsia, debility, scrofula, affections of the alimentary canal and the ænemia of protracted typhoid and malarial fevers. Our distinguished medical brother, Dr. A. B. Pierce, of Weldon, whose absence this year we all so much regret, informs that certain chalybeate springs in Halifax county are famous for medicinal virtues. It requires no undue partiality for North Carolina to say that in the adaptation of her mineral waters to the treatment of disease, as well as in the general health and wealth of her climate, she has no superior in all the States. When Preventive Medicine has wrought its destined work of improvement and reform in her water-supply, and in banishing the causes of typhoid and malarial fevers, she will lead any other State in the great boom of health. Much of our drinking water is what is called hard. This fact is an argument for cisterns, as soft water, when good, is more healthy than hard. That this is so can be easily seen when it is considered the functions observed in our economy by the water we drink. Outside of the water lost by transpiration through the lungs and skin, the use of water is to wash the blood clean—to dissolve and carry out of it the waste material picked up by it and soluble in water. A liquid can only dissolve so much solid matter. If the water is impure, especially if there is an excess of the properties of hard water, its power of dissolving and removing from the blood the proper amount of waste material is lessened. When thus overloaded it will be apt, like an exhausted laborer, to drop part of the load the first chance it gets. Such deposits do occur, especially in those delicate organs, the kidneys, urethra and bladder, causing disease, notably in lime water sections, of gravel, stonh in the bladder, urinary calculus, etc. The effect of the alkaline nature of hard water in the causation

and aggravation of certain forms of disease scarcely needs a reference here. Physicians often find it necessary to put patients suffering with digestive, intestinal and renal diseases upon distiiled or purified water. Dyspepsia, as well as chronic intestinal diseases, are often caused by drinking hard water.

An important factor in improving the water supply of the level and low grounks of the east is the substitution of well constructed cisterns for wells As a general fact the last thought of the people turned upon their water until the operations of our official sanitary system have gradually secured their attention and confidence, and now they are slowly falling into the movement for purified water. Roof rain water of cisterns properly made and kept scrupulously clean, is much to be recommended in view of the uncertain sanitary quality of much of our well water. It is always best, however, to divert to inferior uses the first twenty or thirty minutes of rain until the air and roof are well-washed. Every family using a cistern should be taught the importance of wise precaution to avoid the fermentation of the water. The unhealthy putrefactive stench from cistern water sometimes arising, in warm weather especially, after it has stood a few weeks, comes from causes easily remedied and never to be permitted. To better avoid unhealthy conditions cisterns should be kept cool as well as clean, and ventilated without exposure to dust and free from all sources of contamination. Cisteen water should be filtered. Among the domestic methods to this end is the simple and cheap one of making a filtering chamber in the side of the cistern extending from top to bottom. This should be filled, or party so, with well-washed sand. The sand can be drawn off through a hole at the bottom of the filter with but little waste of water as often as it needs to be washed. To keep the sand out of the faucet a syphon should lead upward to it from the bottom of the filter. Water in cisterns under the ground can be filtered by other arrangements that are readily suggested by intelligent heads of families. Our people have indulged in exaggerated estimates of the expense attendant upon the construction of efficient cisterns and the trouble in keeping them up. To avoid detail it may be said that, under the mechanical and other improvement of the times, the cost is but little, while the advantages of cistern water over that of most of our wells are immense and of incalculable value to those able to appreciate the boon of that health which good drinking water gives.

It has long been established that water containing organic filth is injurious to health. Every medical man knows that drinking water contaminated with vegetable or animal matter produces diphtheria, typhoid fever, dysentery, and other complaints, and that the entire family of zymotic diseases may be propagated by drinking bad water.

Scientific analysis of drinking water in our State declares what has been said and repeated in this report, that a very large proportion of the water-supply of the whole State is contaminated, and therefore it follows that a large number of our avoidable and preventable diseases are owing to this factor of disease. It is no mere conjecture or idle speculation to indulge in this train of thought. It was made the official duty of our able State Chemist to analyze specimens of water sent him from various portions of the State. The records of his office show a grave and alarming contamination of much of the drinking water of the State. He has published much of this analyses, and it is corroborative of the positions I have taken in this paper upon the impurities of our water-supply. This scientific and laborious gentleman, Professor Charles W. Dabney, Jr., analyzed, between September, 1879, and September, 1886, one hundred and sixty (160) specimens and over of different drinking water in differeat parts of the State· A majority of these specimens were sent to him from the towns, counties and cities of the east, most of the remainder from the middle towns, counties and cities, leaving a small portion only from the western portion of the State. Of the specimens analyzed, Professor Dabney's report shows that only about one-third were such as could be pronounced healthy drinking water. About two-thirds at least are condemned by him as unhealthy and therefore unfit for cooking or drinking purposes. The grades of their unhealthiness range from "dangerous," "very bad," "not safe," "abominable," "not good," "suspicious," "rather suspicious," "hardly good," "well needs cleaning," etc. Taking these specimens as the average quality of the drinking water of the middle and eastern portions of the State and it will be observed that about two-thirds of this water is unfit for entrance into the human stomach, and is therefore productive of some form of disease. Animal or vegetable contamination, single or combined, is the general cause assigned for this bad condition of our drinking water. The question of the nature and properties of the impurities and contaminations of our water-supply is of course of much scientific as well as practical importance, leading, as such an inquiry must, to a correction of these causes of disease and to the adoption of the most efficient means of their prevention and removal. It is certainly gratifying to know, that in an enquiry so grave, coming home to every one who drinks unwholesome water, whether ignorantly or knowingly, that an application in this vital line of the principles of this Preventitive Medicine will institute a great and much needed work of improvement and reform in our water-supply. It is certainly a startling truth, well calculated to arouse our people from their slumbering contentment and suicidal indifference, that scarcely one-third of the water drank in the greater part of North Carolina is healthy or fit for use.

The developments of chemical analyses and the microscope are of course essential to correct information in relation to the character of water-supply. Whether the subtle and dangerous corruptions of impure water are owing to the various forms of organized beings in the shape of germs and myriads of bacteria, or are caused by the action and changing character and combinations of inorganic substances and gases, or whether produced by a conjoint action of these diverse causes and separate influences, involve scientific questions of much importance, but still unsettled by the disclosures of chemistry or the microscope. That living beings as well as inorganic matter are found in drinking water and that gases influence its properties, are familiar facts too common-place for dwelling upon here. How they affect health and originate disease are absorbing questions in the profession, as we all know. The germ theory and bacterial origin of disease entered so largely into a paper presented by me to the Society at our last annual meeting that it would be out of place in me now to renew the discussion in noticing the causes of bad drinking water. Investigations still going on in this country and in Europe in this interesting line, embracing the mooted doctrines pertaining thereto, and other inquiries bearing upon causes and pathology of disease promise valuable results to scientists and sanitarians. These mooted questions and discussions are of much practical interest to those who keep abreast with the progress of the times, and who, while appreciating the importance of good drinking water, are not content to remain behind in a knowledge of those agencies and influences that affect health and longevity.

More practical, however, is it for the people to know "who can bring a clean thing out of an unclean?" Job gave it up, it is true, but advances in science have solved the conundrum. Science, only another name for the exposition and understanding of nature, combines with art, which seeks to imitate nature, in penetrating and unfolding the secret. Thus it is verified that where danger is, there Providence permits to man conditions of its avoidance or means of its removal. To every poison there is an antidote. As a means of purifying water every one has at his easy command inexpensive filtering processes and other means of purification to enable him to render impure water clear, pure and healthy. Regarding the fact that water is a solvent of soluble substances as well as a vehicle of insoluble material and living things, these processes and purifications are essential to take away the masses of filth and the millions of disease germs and living beings that abound more or less in impure water and cause disease. Experience has taught our people, living in sections where the water-supply is defective, the benefits of different domestic filters in common use for cleaning and cooling water. But even these means, imperfect

though they are to some extent, greatly fail to be observed and health suffers. Tell them that bad water ought to be boiled before using, or filtered through charcoal, well-washed sand, and other purifiers known to every community, they admit the fact but fail to observe these cheap processes. Still it is encouraging to know that there is more and more appreciation and use of inexpensive mediums for freeing water of mineral substances, organic substances and living things. It is more and more understood, too, that while it is easy to remove suspended matter from water, a filter needs to be durable and readily cleaned in order to be valuable. The custom observed by some families of boiling drinking water before drinking it in order to free it from suspected impurities is in all respects to be commended, as it undoubtedly makes it more healthy. For family use artificially prepared filter beds, resembling as much as practical natural filtrations through natural deposits of sand or gravel, are of much value in the clarification of water, using other artificial appendages for drawing off the water free of sand or gravel and for keeping the bed clean. But something more seems desirable in the filtered water of warm weather to avoid that stale flavor or decaying taste when decaying stuff and earthy matters have been held in solution. This stale flavor of decaying products, organic or inorganic, increasing in hot weather and when water sources are low, indicates the need of still more effective apparatus for cleaning and cooling water. To say nothing of the addition of good ice and other means to this end, it is well to state that the principle of the Hyatt infiltration is coming into popular use in the Hyatt system of public water-works. It is spreading in the Northern States and seems to be coming into use in the water-works of our Southern cities. In the progress of water sanitation the application of the principle, in a cheapened form, suitable for family use, may prove useful in rural districts needing better water-supply.

The influence of ice used in drinking water ought not to escape notice in a paper of this sort. While the investigation of the properties of water-supply is going on with increasing attention and interest, few researches have been made in regard to ice, the consumption of which for drinking purposes is increasing in our State to large proportions. That ice is liable to be a direct source of disease is an established fact. That its purity or impurity depends upon its source and that drinking water may be contaminated by ice is a truth well known to our profession, and it ought to be spread broadcast over the whole State so that the people may be informed. The popular belief is that water in freezing purifies itself. While this may to some extent be true, it has been demonstrated that all the impurities and contaminations of water previous to freezing are not removed or extinguished by the process of freezing, and therefore that ice itself may contain

dangerous elements of disease. Undoubted evidence of this sanitary fact exists. One of our own accomplished American authors has demonstrated it. Allusion is made to Dr. T. Mitchell Prudden, Director of the Laboratory of the Alumni Association of the College of Physicians and Surgeons of New York, whose able paper on "Bacteria in Ice and Their Relations to Disease" is attracting much commendation in the scientific world. He contends that water which contains more than from 50 to 100 living bacteria to the cubic centremetre should not be used for drinking purposes without filtration or other mode of purification, and that pure water contains no bacteria at all. He further says that the data of facts and figures which apply to water analyses and bacterial contaminations of water apply equally to the problems of ice impurities. His experiments upon typhoid bacilli suspended in water lead him to conclude that while many were destroyed, many still remained alive even after prolonged freezing of the water. His investigations unite with the conclusions of other investigators in showing that ice from impure water is not good—that ice formed from sources of pollution and from the water of creeks and rivers impregnated with unhealthy material and the sewerage of towns and cities, is liable to produce disease when taken in drinking water or taken into the stomach simply as ice. Epidemics and other outbreaks of disease have been traced to drinking water contaminated by ice. Our people cannot be too careful, whether as importers or consumers, in enquiring into the character of those ice-harvesting fields of the North that furnish the greater portion of the ice consumed in this State. Depreciating any sensational agitation of the subject, we are untrue to the public health, and wanting in sanitary devotion, if we do not warn our people of the dangers of adulteration in ice as well as of food and drinks.

Pure water is more necessary to health and longevity than fine houses and costly equipages. It is the universal carrier of nourishment and health to the life of this world of selfishness, sorrow and sin. History shows that no people are truly progressive who fail to make proper efforts to secure this great blessing. The civilization of the nineteenth century will show a sad and sorrowful condition at its close if it does not find a universal clamor for good water and as much demand for water-purifying systems as there is for food and other necessities of man. Already has improvement in this and other prime relations of health made such preventive strides that the death rate in this country and in Europe has been much reduced during the last century. Owing to sanitary measures people are living longer and are more healthy than they were one hundred years ago.

When this much-needed improvement and reform in water-supply is worked up to the coming degree of favor and observance among the population of our eastern counties, the exaggerated expression, so often

heard, that the east is sickly, will be among the forgotten things of the past. When that auspicious time comes, as come it soon will, under the impulse of progressive water-sanitation and other sanitary advances, this immense portion of our State will make more rapid and telling strides of progress than ever before. This fair Southern land presents nowhere more useful and magnificent resources of land, forests, agriculture, commerce and manufactures than does this rich and undeveloped portion of our noble old Commonwealth. When the galvanic touches and heavy blows of an improved and improving system of internal improvements, especially of railroads, shall permeate the various counties and combine with the great advantages of water navigation, productive soil, valuable timbers, resources of fish and oysters, and splendid climate, which nature has generously given to the people of those fertile plains and rich swamps, our middle and western brethren will join us, as will the stranger who comes within our gates, in our claim that the east is the Egypt of North Carolina. Drainage, agricultural improvement, air and water sanitation, general hygiene, industrial improvement, and other advantages, natural and acquired, are not only combining to banish the causes of malarial, typhoid, and other dreaded but preventable diseases, but are laying the foundation of that renewed prosperity and substantial progress which leads to wealth and power. Uniting then in harmony and love with our western friends in all movements that are judicious in building up all sections, and ready at all times to join heart and hand with each portion in the onward march to the common health, wealth and prosperity to all, let us rejoice in the welfare of every part and in the common good of the whole State.

LIST OF MEMBERS,

In the Order in which they signed Constitution.

(Those marked * were present at the meeting held in Charlotte, April, 1887.)

[NOTE.—Any person noting any errors or omissions in this roster, will confer a favor if they will write a full correction of such mistakes to the Secretary of the Society at Tarboro, N. C., or the Editors of the NORTH CAROLINA MEDICAL JOURNAL at Wilmington, N. C.

PUBLICATION COMMITTEE.]

NAME.	P. O. ADDRESS.	Signed Constitution.
N J Pittman	Tarboro	1850
*S S Satchwell	Rocky Point	1850
Jno R Mercer	Toisnot	1850
J B Jones	Charlotte	1850
E Burke Haywood	Raleigh	1850
R B Haywood	"	1850
*J B Dunn	"	1850
W G Thomas	Wilmington	1852
A B Pierce	Weldon	1852
Allman Holmes	Clinton	1852
E A Anderson	Wilmington	1852
*J J Summerell	Salisbury	1855
Peter E Hines	Raleigh	1855
J G Ramsay	Rowan Mills	1855
R H Winborne	Edenton	1857
Geo A Foote	Warrenton	1858
Eugene Grissom	Raleigh	1859
*R L Payne	Lexington	1859
F M Rountree	Kinston	1859
E F Ashe	Wadesboro	1859
D B Wood	Rowan Mills	1859
*W J Jones	Goldsboro	1860
*Chas. J O'Hagan	Greenville	1860
*J W. Jones	Tarboro	1860
J F Long	Newbern	1860
J K Ruffin	Wilson	1860
J B Hughes	Newbern	1860
J C Gidney	Shelby	1860
*Wm R Wood	Scotland Neck	1867
*P A Barrier	Mt Pleasant	1867
J H Baker	Tarboro	1867
M T Savage	Scotland Neck	1867
Thos F Wood	Wilmington	1867
Geo L Kirby	Goldsboro	1867
P S Peteway	Enfield	1867
J F Shaffner	Salem	1867
*W T Cheatham	Henderson	1868
Elisha Porter	Rocky Point	1868
F J Haywood	Raleigh	1868
C H Barron	Toisnot	1868
B P Alston	Henderson	1868
J R McCorkle	Mooresville	1869
*G G Smith	Concord	1869
D N Patterson	Mangum	1869
J G King	Warrenton	1869
J P Sugg	Kittrell	1869
L L Staton	Tarboro	1869
*H T Bahnson	Salem	1869
W W Lane	Wilmington	1876
R L Cowan	Rowan Mills	1870
Geo N Ennett	Saunders Store	1870
Chas Duffy, Jr	Newbern	1870
*R F Lewis	Lumberton	1870
Wm J Love	Wilmington	1870
Jas. McKee	Raleigh	1870
*Willis Alston	Littleton	1870
L L Alexander	Topsail Sound	1870
*W J H Bellamy	Wilmington	1870
Geo F Lucas	Point Caswell	1870
Walter Brodie	Wilson	1870
A S Jones	Warrenton	1870
J L Knight	Tarboro	1870
C L Killebrew	"	1870
*W T Ennett	Burgaw	1870
W I Royster	Raleigh	1871
*GeoGillett Thomas	Wilmington	1871
V N Seawell	Wallace	1872
Geo S Attmore	Stonewall	1872
S B Flowers	Mt Olive	1872
*John McDonald	Washington	1872
*Francis Duffy	Newbern	1872
*A G Carr	Durham	1873
*J A Allison	Statesville	1873
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J W Vick	Selma	1873
Isaac E Green	Warrenton	1873
*P L Murphy	Morganton	1873
*Jos. Graham	Charlotte	1874
J M Miller	"	1874
J F Miller	Goldsboro	1874
H K DeArmond	Pineville	1874
*J P McCombs	Charlotte	1874
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W H Lilly	"	1874
Thos. J Moore	Richmond, Va.	1874
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*D W Bulluck	Whitakers	1875
*W H Whitehead	Battleboro	1875
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W C McDuffie	Fayetteville	1876
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J D McMillan	Lumberton	1876
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W H McKinnon	Fayetteville	1876
Beverly Jones	Bethania	1876
Jos Hollingsworth	Mt Airy	1877
J D Roberts	Goldsboro	1877
L H Hill	Germantown	1877
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E N Booker	Leachburg	1877
Jeff Scales	Staten Isl'd,NY	1877
*Geo W Graham	Charlotte	1877
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N S Siewers	Salem	1877
J F Griffith	Clemmonsville	1877
W P Mallett	Chapel Hill	1877
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L G Hunt	Huntsville	1877
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F W Potter	Wilmington	1877
J F Harrell	Whiteville	1877
W P Exum	Goldsboro	1878
A M Lee	Clinton	1878
*J R McClelland	Mooresville	1878
R J Noble	Selma	1878
W H H Cobb	Goldsboro	1878
J H Tucker	Henderson	1878
C G Bryant	Rich Square	1878
E H Hornaday	Willow Green	1878
*P B Barringer	Davidson Coll.	1878
I W Faison	Mt Olive	1878
J A Pollock	Kinston	1878
J W Smith	Reidsville	1879
B A Cheek	Greensboro	1879
J A McLean	McLeansville	1879
J G Ector	Friendship	1879
Hubert Haywood	Raleigh	1879
J M Covington	Rockingham	1879
W R Hollingsworth	Mt Airy	1879
O P Robinson	Arkansas	1879
C E Bradsher	Hurdles Mills	1879
S W Stevenson	Mooresville	1879
H T Trantham	Salisbury	1879
*W P Beall	Greensboro	1879
W A Coble	Brick Church	1879
A D McDonald	Wilmington	1879
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J J Cox	New Garden	1879
D M Prince	Laurinburg	1879
J A Sexton	Raleigh	1879
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N M Johnson	Durham	1879
John C Walton	Prosperity Hill	1879
J T Sledge	Greeneville	1879
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W L Abernathy	Hickory	1879
J M Tomlinson	Bush Hill	1879
*Julian M Baker	Tarboro	1879
*T E Balsley	Riedsville	1879
J L Gunn	Yanceyville	1879
*Thos E Anderson	Statesville	1879
*J M Stansill	Rockingham	1879
W K Anders	Gravel Hill	1880
Rich'd Dillard, Jr	Edenton	1880
Thomas Hill	Goldsboro	1880
H S Norcom	Washington DC	1880
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Ed de la Rive King	Goldsboro	1880
J C Shepard	Scots Hill	1880
K J Powers	Camera	1880
W C Galloway	Snow Hill	1880

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J M Powers	Plymouth	1880
R H Adams	Gastonia	1880
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J L Nicholson	Richlands	1880
*D B Frontis	Lexington	1880
*A W Knox	Raleigh	1880
*John Whitehead	Salisbury	1880
S J Montague	Winston	1880
A B Huntley	Wadesboro	1880
John Irwin, Jr	Villa Franca	1880
Jno A Collins	Enfield	1880
G E Mathews	Ringwood	1880
L Hussey	Warsaw	1880
H T Ivy	Fayetteville	1880
W P Mercer	Toisnot	1880
E T Speed	Tarboro	1880
B F Whiteside	Hickory	1881
W L Crump	South River	1881
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M D Phillips	Dalton	1881
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*J A Reagan	Weaverville	1881
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T B Robertson	Neuse	1881
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*S H Lyle	Franklin	1881
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E Crowell	Lincolnton	1881
R J Wilson	Swanannoa	1881
M H Fletcher	Shufordville	1881
Thos M Jordan	Hookerton	1881
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C Winston	Franklinton	1881
T A Crowell	Monroe	1881
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T F Meisenheimer	Morven	1881
W C Brownson	New Canaan,Ct	1881
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W D Hilliard	Asheville	1881
J W Moose	Mt. Pleasant	1881
A D Pair	Eagle Rock	1881
J H Gilkey	Marion	1881
J H Faison	Faison	1881
*W L Reagan	Ivy	1881
*H B Weaver	Weaverville	1881
J G Craigmils	Marshall	1881
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R L Lackey	Amity Hill	1881
John H Williams	Asheville	1881
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W A Woollen	Randlemans	1882
*J R Irwin	Alexandriana	1882
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H B Furgerson	Halifax	1882
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Geo S Lloyd	Tarboro	1882
*R S Young	Concord	1882
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J A Stevens	Clinton	1883
T S Royster	Williamsboro	1883
I M Taylor	Morganton	1883
J M Hodges	Mt. Olive	1883
S H Rogers	Raleigh	1883
W L Hudson	Hawley's Store	1883
Oscar Gregory	Oxford	1883
W H Bobbitt	Raleigh	1883
F R Harris	Henderson	1883
H H Whitaker	Old Sparta	1883
N P Bodie	Scotland Neck	1883
G C Edwards	Hookerton	1883
E M Summerell	Salisbury	1883
K M Ferguson	Cameron	1883
D B McNeill	Shallotte	1883
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J H Anderson	Tarboro	1883
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P J Macon	Warrenton	1883
H I Clark	Hamilton	1883
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M P Perry	Macon	1884
Wm Edwards	Castalia	1884
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*M R Adams	Statesville	1884
J H Cook	Durham	1884
G T Sikes	Grissom	1884
*W B Pritchard	Faison	1884
J M Manning	Pittsboro	1884
F T Fuller	Raleigh	1884
H P Murray	Wallace	1884
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J B Beckwith	Smithfield	1884
E T White	Oxford	1884
G W Purefoy	Asheville	1884
*A M Herron	Charlotte	1884
M H Futrell	Woodland	1884
*B F McMillan	Plainview	1884
*J E Grimsley	Snow Hill	1884
*R F Gray	Winston	1884
J P Smallwood	Lewiston	1885
Thos A Vicker	Durham	1885
W N Hicks	Fish Dam	1885
S B Woods	Bell's Ferry	1885
L P Sorrell	Kelvin Grove	1885
*J C Whiteside	Morganton	1885
*W H Wilson	Dallas	1885
L M Archey	Concord	1885
C E Adams	Gastonia	1885
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